US Army Corps
of Engineers
Baltimore District

CONSTRUCTION SPECIFICATIONS

ISLE OF WIGHT, SALTMARSH CREATION, PHASE I

WORCESTER COUNTY, MARYLAND

INVITATION NO. **DACW31-03-B-0002**

CONTRACT NO.

DATE: **DEC 09, 2002**

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GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

1.1.1 PROGRESS SCHEDULING AND REPORTING: (AUG 1999)

The Contractor, shall within five days or as otherwise determined by the Contracting Officer, after date of commencement of work, submit for approval a practicable progress schedule showing the manner in which he intends to prosecute the work. Contractor prepared form shall contain the same information as shown on the attached NADB Form 1153 ("Physical Construction Progress Chart" (CENAB-CO-E)

1.1.2 PAYMENTS TO CONTRACTORS: (NOV 1976)

For payment purposes only, an allowance will be made by the Contracting Officer of 100 percent of the invoiced cost of materials or equipment delivered to the site but not incorporated into the construction, pursuant to the Contract Clause entitled "PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS". The Contracting Officer may also, at his discretion, take into consideration the cost of materials or equipment stored at locations other than the jobsite, when making progress payments under the contract. In order to be eligible for payment, the Contractor must provide satisfactory evidence that he has acquired title to such material or equipment, and that it will be utilized on the work covered by this contract. Further, all items must be properly stored and protected. Earnings will be computed using 100% of invoiced value. (CENAB-CO-E)

1.1.3 PURCHASE ORDER: (SEP 1975 REV JUN 1991)

One readable copy of all purchase orders for material showing firm names and addresses, and all shipping bills, or memoranda of shipment received regarding such material, shall be furnished to the appointed Contracting Officer's Representative as soon as issued. Such orders, shipping bills or memoranda shall be so worded or marked that all material can be definitely identified on the drawings. At the option of the Contractor, the copy of the purchase order may or may not indicate the purchase price. (CENAB-CO-E)

1.1.4 NEGOTIATED MODIFICATIONS: (OCT 84)

Whenever profit is negotiated as an element of price for any modification to this contract with either prime or subcontractor, a reasonable profit shall be negotiated or determined by using the OCE Weighted Guidelines method outlined in EFARS 15.902. (Sugg. NAB 84-232)

1.1.5 PHOTOGRAPHS (SEP 85 REV JUN 1991)

The Contractor shall furnish 8" x 10" commercial grade color photographs of the project (with negatives) to the Contracting Officer. These photographs shall be in the quantities and at the intervals as directed by the Contracting Officer. (CENAB-CO)

1.2 JOB CONDITIONS

1.2.1 LAYOUT OF WORK: (APR 1972)

The Contractor shall lay out his work and shall be responsible for all measurements in connection therewith. The Contractor shall furnish, at his own expense, all templates, platforms, equipment, tools and materials and labor as may be required in laying out any part of the work. The Contractor will be held responsible for the execution of the work to such lines and elevations shown on the drawings or indicated by the Contracting Officer. (CENAB)

1.2.2 AVAILABILITY OF UTILITIES INCLUDING LAVATORY FACILITIES: (JUN 1980)

It shall be the responsibility of the Contractor to provide all utilities he may require during the entire life of the contract. He shall make his own investigation and determinations as to the availability and adequacy of utilities for his use for construction purposes and domestic consumption. He shall install and maintain all necessary supply lines, connections, piping, and meters if required, but only at such locations and in such manner as approved by the Contracting Officer. Before final acceptance of work under this contract, all temporary supply lines, connections and piping installed by the Contractor shall be removed by him in a manner satisfactory to the Contracting Officer. (CENAB)

1.2.3 Utility Markings (Aug 1999)

The Contractor shall contact the Government and the One-Call Service, a minimum of 14 days and 48 hours, respectively, prior to any excavation, Miss Utility requesting utility location markings. The Contractor shall not proceed with any excavation until all utilities, including abandoned utilities, have been marked to the satisfaction of the Contracting Officer. Prior to requesting the marking of utilities, the Contractor shall stake out proposed excavations and limits of work with white lines ("White Lining"). It is the Contractor's responsibility to ensure that all permits (excavation or otherwise are current and up-to-date without expiration. In addition to the above requirements the Contractor shall:

a) Visually survey and verify that all utility markings are consistent with existing appurtenances such as manholes, valve boxes, poles, pedestals, pad-mounted devices, gas meters, etc. prior to any excavation.

b) Hand dig test holes to verify the depth and location of all utilities prior to any mechanical excavation within the limits of work. Other non-damaging methods for utility verification, as indicated in (d) below, may be considered subject to approval by the Contracting Officer. Also, verify that any abandoned utilities are not active.

c) Preserve all utility markings for the duration of the project to the furthest extent possible.

d) When excavation is performed within 2 feet of any utility line, a non-damaging method of excavation shall be used. The non-damaging method shall be hand digging. Other non-damaging methods, such as, soft digging, vacuum excavation, pneumatic hand tools, may be considered subject to approval by the Contracting Officer.

e) Regardless of the type of excavation, the Contractor shall notify the Contracting Officer a minimum of 72 hours prior to any excavation activity. Failure to notify the Contracting Officer can result in the issuance of a "Stop Work" order, which shall not be justification for contract delay or time extension. The Government reserves the right to have personnel present on site during any type of excavation.

f) The Contractor's Quality Control System Manager shall ensure that all excavation requirements herein are met at the time of the preparatory phase of quality control, and that the excavation procedures are reviewed during the preparatory phase meeting. This preparatory phase of control shall also establish and document contingency plans and actions to be followed in the event that existing utilities are damaged or interrupted. Locations of shut off or isolation devices along with other safety features shall be established and their operation reviewed.

g) Any work other than excavation in the vicinity of a utility, that could damage or interrupt a utility, such as, exterior or interior work near transformers, power lines, poles, above ground gas lines, gas meters, etc., shall be done with extreme care. The Contractor shall specifically note during the preparatory phase of quality control, the construction techniques to be used to preclude damaging or interrupting any utility. This preparatory phase of control shall also establish and document contingency plans and actions to be followed in the event that existing utilities are damaged or interrupted. Locations of shut off or isolation devices along with other safety features shall be established and their operation reviewed.

h) The Contractor shall complete a risk assessment, using the attached checklist, at least one week prior to the start of any excavation or other work in the vicinity of a utility. The risk assessment shall be submitted for government approval prior to any excavation or other work in the vicinity of a utility. A risk assessment shall be completed for each definable feature of work encountering utilities and shall include all utilities anticipated to be encountered.

1.2.4 COMPLIANCE WITH STATE OF MARYLAND DEPARTMENT OF NATURAL RESOURCES REGULATIONS: (JUL 1980)

The site of the work is at a State of Maryland Wildlife Management Area and all rules and regulations issued by the Owner covering general safety, security, sanitary requirements, pollution control, traffic regulations and parking, shall be observed by the Contractor. Information regarding these requirements may be obtained by contacting the Contracting Officer, who will provide such information or assist in obtaining same from appropriate authorities. (MEMO)

1.2.5 ASBESTOS

1.2.5.1 ASBESTOS HANDLING AND REMOVAL: (FEB 85)

Through site investigations, friable asbestos has not been found, however if asbestos is encountered, Contractor is to notify Contracting Officer immediately.(CENAB)

1.2.6 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER:

1.2.6.1 Procedure for Time Extensions

This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance the contract clause entitled "Default: (Fixed Price Construction)". In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

a. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

b. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

1.2.6.2 Monthly Schedule

The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7	6	6	7	7	6	4	5	3	5	4	4

1.2.6.3 Notice to Proceed (NTP)

Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the contractor's scheduled work day. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph "Monthly Schedule",above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the contract clause entitled "Default (Fixed Price Construction)".

1.2.7 WORKING HOURS: (DEC 93)

It shall be the Contractors responsibility to obtain the working hours other than the normal five (5) day work week 8:00 am to 4:30 pm. (CENAB-CO-SQ)

1.3 SAFETY

1.3.1 GENERAL

Worker safety is of paramount importance. The Contractor shall comply with the Contract Clause in the Solicitation entitled ACCIDENT PREVENTION, including the U.S. Army Corps of Engineers Safety and Health Requirements Manual referred to therein in addition to the provisions of this specification.

1.3.1.1 ACCIDENTS

Chargeable accidents are to be investigated by both Contractor personnel and the Contracting Officer.

1.3.1.2 ACCIDENT REPORTING, ENG FORM 3394

Section 1, Paragraph 01.D, of EM 385-1-1 (3 Sep 1996) "U.S. Army Corps of Engineers Safety and Health Requirements Manual" and the Contract Clause entitled ACCIDENT PREVENTION are amended as follows: The prime Contractor shall report on Eng Form 3394, supplied by the Contracting Officer, all injuries to his employees or subcontractors that resultin lost time and all damage to property and/or equipment in excess of $2,000 per incident. Verbal notification of such accident shall be made to the Contracting Officer within 24 hours. A written report on the above noted form shall be submitted to the Contracting Officer within 72 hours following such accidents. The written report shall include the following:

a. A description of the circumstances leading up to the accident, the cause of the accident, and corrective measures taken to prevent recurrence.

b. A description of the injury and name and location of the medical facility giving examination and treatment.

c. A statement as to whether or not the employee was permitted to return to work after examination and treatment by the doctor, and if not, an estimate or statement of the number of days lost from work. If there have been days lost from work, state whether or not the employee has been re-examined and declared fit to resume work as of the date of the report.

1.3.1.3 OSHA Requirements

1.3.1.4 OSHA Log

A copy of the Contractor's OSHA Log of Injuries shall be forwarded monthly to the Contracting Officer.

1.3.1.5 OSHA Inspections:

Contractors shall immediately notify the Contracting Officer when an OSHA Compliance official (Federal or State representative) presents his/her credentials and informs the Contractor that the workplace will be inspected for OSHA compliance. Contractors shall also notify the Contracting Officer upon determination that an exit interview will take place upon completion of the OSHA inspection. (NABSA OCT 05, 1976)

1.4 CONTRACTOR QUALITY CONTROL

1.4.1 GENERAL

The Contractor shall provide and maintain an effective quality control program that complies with the Contract Clause entitled "Inspection of Construction." The CQC Program through inspection and reporting shall demonstrate and document the extent of compliance of all work with the standards and quality established by the contract document. The burden of proof of contract compliance is placed on the Contractor and not assumed by the Government. The Contractor's Quality Control will not be accepted without question.

1.4.2 CONTROL

Contractor Quality Control (CQC) is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. The controls shall be adequate to cover all construction operations, including both on-site and off-site fabrication, and will be keyed to the proposed construction sequence.

1.4.2.1 Physical Examination

A physical examination of required materials, equipment, and sample work to assure that they are on hand for the stage of work about to begin.

1.4.2.2 Physical Inspections

Daily checks shall be performed to assure continuing compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation.

1.4.3 WORK DEFICIENCIES

The Contractor shall not build upon or conceal non-conforming work. If deficiencies indicate that the Contractor's Quality Control is not adequate or does not produce the desired results, corrective actions shall be taken by the Contractor. If the Contractor does not promptly make the necessary corrections, the Contracting Officer may issue an order stopping all or any part of the work until satisfactory corrective action has been taken. Payment for deficient work will be withheld until work has been satisfactorily corrected or other action is taken pursuant to the Contract Clause entitled, "Inspection of Construction." If recurring deficiencies in an item or items indicated that the quality control is not adequate, such corrective actions shall be taken as directed by the Contracting Officer.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "G" designation are for information only. The following shall be submitted in accordance with this section:

SD-01 Data

CQC Program; G, ED.

SD-07 Schedules

Progress Schedule; G, ED.

A schedule that shows the manner in which the Contractor intends to prosecute the work.

Modified Chart; G, ED.

Prepared when changes are authorized that result in contract time extensions.

SD-08 Statements

Change Notification; G, ED

Any changes made by the Contractor.

SD-09 Reports

OSHA Log

A log shall be reported monthly for injuries.

CQC Program; G, ED.

Checklist; G, ED.

A Risk Assesment for excavation and other work in the vicinity of utilities.

SD-18 Records

Burning; G, ED

With the approval the specific time, location and manner of burning.

Title Evidence

Payment Evidence

Photographs

1.5.1 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.5.1.1 Government Approved

Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specification and Drawings for Construction," they are considered to be "shop drawings."

1.5.1.2 Information Only

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referenced above.

1.5.2 APPROVED SUBMITTALS

The approval of submittals by the Contracting Officer shall not be

construed as a complete check, but will indicate only that the general method of construction, materials, detailed and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the CQC requirements of this contract, is responsible for the dimensions and design of adequate connections, details and satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be given consideration unless accompanied by an explanation as to why a substitution is necessary.

1.5.3 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies as specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, notice as required under Contract Clause entitled "Changes" shall be given promptly to the Contracting Officer.

1.5.4 GENERAL

The Contractor shall submit all items listed on the Submittal Register (ENG Form 4288) or specified in the other sections of these specifications. The Contracting Officer may request submittals in addition to those listed when deemed necessary to adequately describe the work covered in the respective sections. Submittals shall be made in the respective number of copies and submitted to the Contracting Officer. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor and each respective transmittal form (ENG Form 4025) shall be stamped, signed and dated by the Contractor certifying that the accompanying submittal complies with the contract requirements. Proposed deviations from the contract requirements shall be clearly identified. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby.

1.5.5 SUBMITTAL REGISTER: (ENG FORM 4288)

At the end of this section is one set of ENG Forms 4288 listing each item of equipment and material for which submittals are required by the specifications. Columns "d" through "r" (abbreviations in column "p" are defined as follows: "AR" means Area Office; "AE" means architect-engineer; and "ED" means Engineering Division) have been completed by the Government. The Contractor shall complete columns "a", "b", "c", and "s" through "z" and return 2 completed copies to the Contractor Officer for approval within 30 calendar days after Notice to Proceed. The approved submittal register will become the scheduling document and will be used to control submittals throughout the life of the contract. This register and the progress schedules shall be coordinated.

1.5.6 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 30 calendar days exclusive of mailing time) shall be allowed on the register for review and

approval. No delays, damages or time extensions will be allowed for time lost in late submittals.

1.5.7 TRANSMITTAL FORM (ENG FORM 4025)

The transmittal form (ENG Form 4025) shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care will be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

1.5.8 SUBMITTAL PROCEDURE

Six (6) copies of submittals shall be made as follows:

1.5.8.1 Procedures

This paragraph is in addition to the requirements set forth in Contract Clause entitled "Specifications and Drawings for Construction" (ER 415-1-10). In the signature block provided on ENG Form 4025 the Contractor certifies that each item has been reviewed in detail and is correct and is in strict conformance with the contract drawings and specifications unless noted otherwise. The accuracy and completeness of submittals is the responsibility of the Contractor. Any costs due to resubmittal of documents caused by inaccuracy, lack of coordination, and/or checking shall be the responsibility of the Contractor. This shall include the handling and review time on the part of the Government. Each variation from the contract specifications and drawings shall be noted on the form; and, attached to the form, the Contractor shall set forth, in writing, the reason for and description of such variations. If these requirements are not met, the submittal may be returned for corrective action.

1.5.8.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variations" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.5.9 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being stamped and dated. Four (4) copies of the submittal will be retained by the Contracting Officer and two (2) copies of the submittal will be returned to the Contractor.

1.5.10 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will be returned. Approval of the Contracting Officer is not required on information only submittals. These submittals will be used for information purposes. The government reserves the right to require the Contractor to resubmit any item found not to comply with the contract.

1.5.11 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

(Firm Name)

_____ Approved

_____ Approved with corrections as noted on submittal data and/or attached sheet(s).

SIGNATURE: _____

TITLE: _____

DATE: _____

1.6 ENVIRONMENTAL PROTECTION

1.6.1 APPLICABLE REGULATIONS

The Contractor and his subcontractors in the performance of this contract, shall comply with all applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement in effect on the date of this solicitation, as well as the specific requirements stated elsewhere in the contract specifications.

1.6.2 NOTIFICATION

The Contracting Officer will notify the Contractor of any non-compliance with the foregoing provisions and the action to be taken. The Contractor shall, after receipt of such notice, immediately take corrective action. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of time lost due to any such stop order shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

1.6.3 PROTECTION OF WATER RESOURCES

The Contractor shall not pollute streams, lakes or reservoirs with fuels, oils, bitumens, calcium chloride, acid construction wastes or other harmful materials. All work under this contract shall be performed in such a manner that objectionable conditions will not be created in streams through or adjacent to the project areas.

1.6.4 BURNING

Burning will be not be allowed.

1.6.5 DUST CONTROL

The Contractor shall maintain all work area free from dust which would contribute to air pollution. Approved temporary methods of stabilization consisting of sprinkling, chemical treatment, light bituminous treatment or

similar methods will be permitted to control dust. Sprinkling, where used, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs.

1.7 AS-BUILT DRAWINGS

1.7.1 PROGRESS MARKED UP AS-BUILT PRINTS

The Contractor shall mark up one set of paper prints to show the as-built conditions. These as-built marked prints shall be kept current and available on the jobsite at all times. All changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. The as-built marked prints will be jointly inspected for accuracy and completeness by the Contracting Officer's representative and a responsible representative of the Construction Contractor prior to submission of each monthly pay estimate. The drawings shall show the following information, but not be limited thereto:

1.7.1.1 Final Revisions

When final revisions have been completed, each drawing shall be lettered or stamped with the words "RECORD DRAWING AS-BUILT" followed by the name of the General Contractor in letters at least 3/16" high.

1.7.2 DRAWING PREPARATION

Upon approval of the as-built prints submitted, the Contractor will be furnished the original set of contract drawings with all amendments incorporated. These drawings shall be modified as may be necessary to correctly show all the features of the project as it has been constructed by bringing the contract set into agreement with the approved as-built prints, adding such additional drawings as may be necessary. These drawings are part of the permanent records of this project and the Contractor shall be responsible for the protection and safety thereof until returned to the Contracting Officer. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at his expense.

PART 2 PRODUCT -- NOT APPLICABLE

PART 3 EXECUTION -- NOT APPLICABLE

-- End of Section --

PHYSICAL CONSTRUCTION PROGRESS CHART

CONTRACTOR	PROJECT	CONTRACT DESCRIPTION	SUBMITTED FOR APPROVAL	DATE	DATE NOTICE TO PROCEED RECEIVED
CONTRACT NUMBER	LOCATION		APPROVAL RECOMMENDED	DATE	STARTING DATE
			APPROVED	DATE	COMPLETION DATE

MILESTONE DATES

PRINCIPAL CONSTRUCTION FEATURE	EST. COST	DURATION CAL. DAYS

NADB Form 1153
27 Mar. 73

RISK ASSESSMENT FOR
EXCAVATION AND OTHER WORK IN THE VICINITY OF UTILITIES

PROJECT NAME:_____
CONTRACT NUMBER:_____
PROJECT INSTALLATION AND LOCATION:_____
PROPOSED EXCAVATION START DATE:_____

1. ☐ ESTABLISH EXCAVATION DETAILS AND DRAWINGS (check when completed)

2. ☐ PROPOSED EXCAVATION AREA MARKED ("white lining") (check when completed)

3. ☐ CONTACT APPROPRIATE ONE-CALL SERVICE FOR PUBLIC UTILITIES:
MD: Miss Utility 1-800-257-7777 N Y : New York City - Long Island One Call Center 1-800-272-4480
N. VA: Miss Utility 1-800-552-7777 PA: Pennsylvania One-Call System Incorporated 1-800-242-1776
VA: Miss Utility of VA 1-800-552-7001 DC: Miss Utility 1-800-257-7777
ONE-CALL NATIONAL REFERRAL CENTER: 1-888-258-0808

☐ CONTACT INSTALLATION/OWNERS OF ALL PRIVATELY OWNED UTILITIES (NON ONE-CALL MEMBERS)

4. ☐ DATE UTILITIES MARKED AND METHOD OF MARKING
ONE-CALL LOCATORS _____
OTHER LOCAT ORS _____

5. ☐ CONTACT APPROPRIATE DPW REPRESENTATIVES AND COMPLY WITH INSTALLATION PERMIT REQUIREMENTS: _____

6. ☐ UTILITIES IDENTIFIED ON-SITE:
☐ NONE ☐ ELECTRIC ☐ GAS ☐ WATER ☐ TELEPHONE ☐ CATV ☐ SEWER ☐ OTHER _____

7. ☐ LEVEL OF RISK: (Based upon personnel safety and consequences of utility outages.)
☐ SEVERE: Excavation required within the immediate vicinity (<2-ft) of a MARKED utility.
☐ MODERATE: Excav. required outside the immediate vicinity (> 2-ft) of MARKED utility.
☐ MINIMAL: Excavation required in an area with NO utilities.

8. ☐ EXISTING FACILITIES/UTILITIES IN VICINITY:
☐ NON-CRITICAL ☐ MISSION CRITICAL ☐ HIGH-PROFILE ☐ CEREMONIAL
☐ OTHER_____
☐ CONSEQUENCES IF EXISTING UTILITIES ARE DAMAGED/DISRUPTED _____
_____

9. ☐ ENGINEERING CONTROLS REQUIRED:
☐ NONE ☐ HAND EXCAVATE TO LOCATE UTILITY ☐ EXCAVATE WITH DUE CARE
☐ OTHER_____

10. ☐ ADMINISTRATIVE CONTROLS REQUIRED:
☐ Notification of Contracting Officer's Representative, NOTIFIED on: _____
☐ Notification of Installation/DPW Representative, NOTIFIED on:_____

11. ☐ EMERGENCY NOTIFICATION AT INSTALLATION: POC & PHONE NUMBER _____

THE INFORMATION NOTED ABOVE IS ACCURATE AND THE WORK IS READY TO PROCEED
SIGNED and DATE _____CQC MANAGER

12. ☐ ON-SITE GOVERNMENT REP. RECOMMENDATION FOR APPROVAL TO EXCAVATE:
☐ YES ☐ NO SIGNATURE AND DATE: _____
Comments:_____

13. ☐ AREA ENGINEER APPROVAL TO EXCAVATE:
☐ APPROVED ☐ DENIED SIGNATURE AND DATE: _____
Comments:_____

14. ☐ CHIEF,_____ DIVISION APPROVAL TO EXCAVATE:
☐ APPROVED ☐ DENIED SIGNATURE AND DATE: _____
Comments:_____

RECORD DRAWING AS-BUILT

XYZ CONTRACTOR

Plate: 1

Sheet Number: T-1

FT. INDIANTOWN GAP PENNSYLVANIA

EQUIPMENT CONSENTRATION SITE

COVER SHEET

U.S. ARMY ENGINEER DISTRICT, BALTIMORE CORPS OF ENGINEERS BALTIMORE, MARYLAND	Designed by:	Date: JAN 2001	Rev.
	Dwn by: / Ckd by:	Design file no.	
A/E FIRM/CONTRACTOR 3 LINES PROVIDED OR LOGO	Reviewed by:	Drawing Number: F-XXX-XX-XX	
	Submitted by: Chief, Branch	File name: FILENAME Plot date: 12/25/00 Plot scale: 1=1	

Mark	Description	Date	Appr.	Mark	Description	Date	Appr.
	AS-BUILT	10 SEP 02					
3	REVISED SECTION A-A AND C-C	5 JAN 01	A.E. D.P.				
2	REVISED PER AMENDMENT NO. 2	30 DEC 00	A.E. D.P.				
1	REVISED PER AMENDMENT NO. 1	25 DEC 00	A.E. D.P.				

ATTACHMENT 1

SECTION 01090

SOURCES FOR REFERENCE PUBLICATIONS

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the sponsoring organization, e.g. ASTM B 564 Nickel Alloy Forgings. However, when the sponsoring organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the organizations whose publications are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the sponsoring organization should be ordered from the source by title rather than by number.

AGRICULTURAL MARKETING SERVICE (AMS)

Seed Regulatory and Testing Branch
USDA, AMS, LS Div.
Room 209, Bldg. 306, BARC-East
Beltsville, MD 20705-2325
Ph: 301-504-9430
Fax: 301-504-8098
Internet: http://www.ams.usda.gov/lsg
e-mail: james_p_triplitt@usda.gov
AOK 6/00
LOK 6/00

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

444 N. Capital St., NW, Suite 249
Washington, DC 20001
Ph: 800-231-3475 202-624-5800
Fax: 800-525-5562 202-624-5806
Internet: www.aashto.org
AOK 6/00
LOK 6/00

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

100 Barr Harbor Drive
West Conshohocken, PA 19428-2959
Ph: 610-832-9585
Fax: 610-832-9555
Internet: www.astm.org

AOK 6/00
LOK 6/00

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

P.O. Box 5690
Grandbury, TX 76049-0690
Ph: 817-326-6300
Fax: 817-326-6306
Internet: http://www.awpa.com
AOK 8/00
LOK 6/00

CODE OF FEDERAL REGULATIONS (CFR)

Order from:
Government Printing Office
Washington, DC 20402
Ph: 202-512-1800
Fax: 202-275-7703
Internet: http://www.gpo.gov
AOK 8/00
LOK 6/00

CORPS OF ENGINEERS (COE)

Order CRD-C documents from:
U.S. Army Engineer Waterways Experiment Station
ATTN: Technical Report Distribution Section, Services Branch, TIC
3909 Halls Ferry Rd.
Vicksburg, MS 39180-6199
Ph: 601-634-2664
Fax: 601-634-2388
Internet: www.libweb.wes.usace.army.mil/index.htm
AOK 10/00
LOK 6/00

ENGINEERING MANUALS (EM)

USACE Publications Depot
Attn: CEIM-SP-D
2803 52nd Avenue
Hyattsville, MD 20781-1102
Ph: 301-394-0081
Fax: 301-394-0084
Internet: www.usace.army.mil
AOK 8/00
LOK 6/00

ENGINEERING REGULATIONS (ER)

USACE Publications Depot
Attn: CEIM-SP-D
2803 52nd Avenue
Hyattsville, MD 20781-1102
Ph: 301-394-0081
Fax: 301-394-0084
Internet: www.usace.army.mil

AOK 8/00
LOK 6/00

SOUTHERN PINE INSPECTION BUREAU (SPIB)

4709 Scenic Highway
Pensacola, FL 32504-9094
Ph: 850-434-2611
Fax: 850-433-5594
e-mail: spib@spib.org
Internet: www.spib.org
AOK 8/00
LOK 6/00

-- End of Section --

SECTION 01200

WARRANTY REQUIREMENT

PART 1 GENERAL

1.1 WARRANTY OF CONSTRUCTION

The Contractor shall warranty all materials and workmanship. in accordance with Contract Clause (FAR 52.246-21), "WARRANTY OF CONSTRUCTION"

1.2 MANUFACTURER'S WARRANTY:

The Contractor shall provide manufacturer's warranties, when available, on all equipment for one year starting from the day of facility acceptance by the Government. Any warranty offered by the manufacturer for periods greater than one year or required by other sections of the specifications shall also be provided.

1.3 WARRANTY PAYMENT

Warranty work is a subsidiary portion of the contract work, and has a value to the Government of [ ]. The Contractor wil1 assign a value of that amount in the breakdown for progress payments mentioned in the Contract Clause (FAR 52.232-5) "Payments Under Fixed-Price Construction". If the Contractor fails to respond to warranty items as provided in paragraph CONTRACTOR'S RESPONSE TO WARRANTY SERVICE REQUIREMENTS below, the Government may elect to acquire warranty repairs through other sources and, if so, shall backcharge the Contractor for the cost of such repairs. Such backcharges shall be accomplished under the Contract Clause (FAR 52.243-4) "CHANGES" of the contract through a credit modification(s).

1.4 PERFORMANCE BOND:

The Contractor's Performance Bond will remain effective throughout the construction warranty period and warranty extensions.

1.4.1 Failure to Commence

In the event the Contractor or his designated representative(s) fail to commence and diligently pursue any work required under this clause, and in a manner pursuant to the requirements thereof, the Contracting Officer shall have the right to demand that said work be performed under the Performance Bond by making written notice on the surety. If the surety fails or refuses to perform the obligation it assumed under the Performance Bond, the Contracting Officer shall have the work performed by others, and after completion of the work, may demand reimbursement of any or all expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

1.5 PRE-WARRANTY CONFERENCE:

Prior to contract completion and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this specification. Communication procedures for Contractor notification of

warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be reviewed at this meeting. The Contractor shall provide names, addresses, and telephone numbers of all subcontractors, equipment suppliers, or manufacturers with specific designation of their area of responsibilities if they are to be contacted directly on warranty corrections. This point of contact will be located within the local service area of the warranted construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status. Minutes of the meeting will be prepared by the Government and signed by both, the Contractor and the Contracting Officer. The minutes shall become part of the contract file.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-14 Samples

Sample Tags

To identify the warranty for all Contractor and Government furnished equipment which the Contractor installs.

1.7 ADDITIONAL REQUIREMENTS

1.7.1 Equipment Warranty Identification Tags:

The Contractor shall provide warranty identification tags on all Contractor and Government furnished equipment which he has installed.

1.7.1.1 Format and Size for Tags

The tags shall be similar in format and size to the exhibits provided by this specification, they shall be suitable for interior and exterior locations, resistant to solvents, abrasion, and to fading caused by sunlight, precipitation. etc. . These tags shall have a permanent pressure-sensitive adhesive back, and they shall be installed in a position that is easily (or most easily) noticeable. Contractor furnished equipment that has differing warranties on its components will have each component tagged.

1.7.1.2 Sample Tags

Sample tags shall be filled out representative of how the Contractor will complete all other tags. These tags shall be submitted to the Government.

1.7.1.3 Tags for Warranted Equipment:

The tag for this equipment shall be similar to the following. Exact format and size will be as approved.

EQUIPMENT WARRANTY
CONTRACTOR FURNISHED EQUIPMENT

MFG: _____ MODEL NO.: _____

SERIAL NO.: _____ CONTRACT NO.: _____

CONTRACTORS NAME: _____

CONTRACTOR WARRANTY EXPIRES: _____

MFG WARRANTY(IES) EXPIRE: _____

EQUIPMENT WARRANTY
GOVERNMENT FURNISHED EQUIPMENT

MFG: _____ MODEL NO.: _____

SERIAL NO.: _____ CONTRACT NO.: _____

DATE EQUIPMENT PLACED IN SERVICE: _____

MFG WARRANTY(IES) EXPIRES: _____

1.7.1.4 Execution

The Contractor will complete the required information on each tag and install these tags on the equipment by the time of and as a condition of final acceptance of the equipment. All tags shall be mechanically attached to the equipment as directed by the Contracting Officer.

1.7.1.5 Equipment Warranty Tag Replacement.

The contractor shall provide new tags on repaired or replaced equipment during the warranty period. The tag shall be identical to the original tag, except that the Contractor's warranty expiration date shall be updated to show the correct warranty experation date.

1.8 CONTRACTOR'S RESPONSE TO WARRANTY SERVICE REQUIREMENTS.

1.8.1 Notification to Warranty Service Requirements

Following oral or written notification by authorized representative of the installation designated in writing by the Contracting Officer, the Contractor shall respond to warranty service requirements in accordance with the "Warranty Service Priority List" and the three categories of priorities listed below.

1.8.1.1 Categories of Priorities

a. First Priority Code 1: Perform on site inspection to evaluate situation, determine course of action, initiate work within 24 hours and work continuously to completion or relief.

b. Second Priority Code 2: Perform on site inspection to evaluate situation, determine course of action, initiate work within 48 hours and work continuously to completion or relief.

c. Third Priority Code 3: All other work to be initiated within 5 work days end work continuously to completion or relief.

1.8.1.2 Warranty Service Priority List

ELECTRICAL:

Code 1:

a. Power failure (entire area or any building operational after 1600 hours).
b. Traffic control devices.
c. Security lights.

Code 2:

a. Power failure (no Power to a room or part of building),
b. Receptacle and lights.
c. Fire alarm systems.

1.8.2 Availability of Required Parts

Should parts be required to complete the work and the parts are not immediately available the Contractor shall have a maximum of 12 hours after arrival at the job site to provide authorized representative of the installation with firm written plan for emergency alternatives and

temporary repairs for Government participation with the Contractor to provide emergency relief until the required parts are available on site for the Contractor to perform permanent warranty repair. The Contractors plan shall include a firm date and time that the required parts shall be available on site to complete the permanent warranty repair.

PART 2 PRODUCTS - NOT APPLICABLE

PART 3 EXECUTION - NOT APPLICABLE

-- End of Section --

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 GENERAL

The general outline of the principal features of each item as listed does not in any way limit the responsibility of the Contractor for making a thorough investigation of the drawings and specifications to determine the scope of work under the entire contract. Payment to the Contractor of the amounts based on the quantities of work as measured in accordance with the specified methods of measurement and the prices stipulated in the accepted proposal will constitute complete compensation for all work shown on the drawings, provided in the specifications or other Contract Documents and all costs of accepting the general risks, liabilities and obligations expressed or implied. Payment under all items shall include, but not necessarily be limited to, compensation for furnishing all supervision, labor, equipment, materials and services (including overhead and profit), as well as performing all work required to accomplish and complete the work specified under each item and other work required. Miscellaneous items of work not specifically covered by the lump sum or unit priced items listed herein shall be considered incidental to the job.

1.2 LUMP SUM ITEMS

The quantities under lump sum items will not be measured except for the purpose of determining reasonable interim payments unless otherwise specified. Interim payments will be made in accordance with the estimated value of work done as determined by the Contracting Officer or as specified in this section.

1.3 UNIT PRICE ITEMS

1.3.1 Excavation and Fill Items

Excavation and/or removal and fill items will be measured from existing ground levels to excavation surfaces shown on the drawings or as directed by the Contracting Officer. Fill items will be measured from existing ground levels to final fill surfaces shown on the drawings or as directed by the Contracting officer.

1.3.2 Existing Ground Levels

Existing ground levels shall be surveyed prior to any disturbances in accordance with the relevant provisions of these specifications. In the event existing surfaces are not clearly shown on the drawings, the Contractor shall obtain clarification from the Contracting Officer prior to commencement of work.

1.4 PAYMENT ITEMS

1.4.1 BASE BID ITEMS

1.4.1.1 Performance and Payment Bid Bonds Reimbursement (Item No. 0001)

The Government will reimburse the Contractor for the entire amount of premiums paid for Performance, Payment and Bid Bonds (including coinsurance and reinsurance agreements where applicable) at the contract lump sum amount under the Unit Price Schedule Item No. 0001, entitled Performance and Payment Bonds Reimbursement. Such payment will be made only after the Contractor furnishes to the Government evidence of full payment to the surety. In no case will any payment be made by the Government for reimbursement of Performance, Payment and Bid Bonds exceeding that amount bid by the Contractor under the aforementioned Unit Price Schedule Item.

1.4.1.2 Mobilization and Demobilization (Item No. 0002)

1.4.1.2.# Scope

Mobilization shall include all costs associated with the transfer of the following equipment from its home station to the site:

a. The cranes, draglines, bulldozers, dump trucks, and similar large construction equipment required to construct the road work, observation walkway construction, and stonework.

Mobilization shall also include, but not limited to, installation of all temporary construction items such as silt fence, stabilized construction entrance, orange blaze fencing; surveys; and project setup.

Demobilization shall include all costs associated with transferring the above equipment back to its point of origin and removing all temporary construction items.

1.4.1.2.# Payment

Costs for mobilization and demobilization as defined above shall be paid for in accordance with Bid Item No. 0002, Mobilization and Demobilization, of the Unit Price Schedule. Sixty percent (60%) of the contract lump sum price for Item No. 0002 shall be paid after the complete setup of the equipment. The remaining 40 percent (40%) shall be paid after the removal of all equipment from the site and the completion of all clean-up of the work site.

1.4.1.3 Stonework (Item 0003)

Stonework will not be measured for payment. Payment for stonework required for construction of all stone breakwaters and sills, including all incidentals; demolition and removal of steel bulkhead; and survey work shall be included in the Lump Sum Price for Bid Item No. 0004, Stonework.

1.4.1.4 Geotextile for Stonework (Item No. 0004)

Geotextile installation will not be measured for payment. Payment for geotextile required for construction of all stonework, including all incidentals shall be included in the Lump Sum Price for Bid Item No. 0004, Geotextile for Stonework.

1.4.1.5 Piles with Warning Signs (Item 0005)

Pile and warning sign installation inclusive will not be measured for payment. Payment for pile and warning sign installation inclusive including all incidentals shall be included in the Lump Sum Price for Bid Item No.

0005, Piles with Warning Signs.

1.4.1.6 Aggregate Base Course (Item 0006)

The Contractor shall submit his lump sum price for Aggregate Base Course based on a measured 265 cubic yards of aggregate base course required to construct the roadway base to the specified cross section as shown on the Contract Drawings. Payment for aggregate base course, including all demolition, grading and incidentals, shall be included in the Lump Sum Price for Bid Item No. 0006, Agregate Base Course. Any quantity of aggregate base course greater than 265 cubic yards will be measured for payment as defined in Bid Item No. 0011, listed herein.

1.4.1.7 Observation Walkway Construction (Item 0007)

Walkway construction will not be measured for payment. Payment for observation walkway construction, including all incidentals, shall be included in the Lump Sum Price for Bid Item No. 0007, Observation Walkway Construction.

Payment for each acceptably driven pile will be included in the Lump Sum Price for Bid Item No. 0007. Acceptably driven piles are determined by the length and type of pile specified or directed to be driven; this price includes all items incidental to furnishing and driving the 50 foot long test piles, piles, redriving uplifted piles, any required notching, the cutting off of all piles at the cutoff elevation, and the pile caps. Lump sum payment for piles driven in lengths as required up to and including 30 feet in place below the cutoff elevation will be included within Lump Sum Bid Item No. 0007.

1.4.1.8 Guard Rail (Item No. 0008)

Installation of the guard rail, as specified on the Contract Drawings, will not be measured for payment. Payment for the guard rail, including all labor, materials and other incidentals shall be included in the Lump Sum Price for Bid Item No. 0008, Guard Rail.

1.4.1.9 Storm Drain Culvert (Item No. 0009)

Installation of the storm drain culvert, as specified on the Contract Drawings, will not be measured for payment. Payment for the storm drain culvert, including all labor, materials and other incidentals shall be included in the Lump Sum Price for Bid Item No. 0009, Storm Drain Culvert.

1.5 UNIT PRICE PAYMENT ITEMS

1.5.1 Additional Pile Length (Item 0010)

1.5.1.1 Payment

Payment for additional pile length shall be made in accordance with Item No. 0010, Additional Pile Length, which shall include all costs for material, placement, equipment, labor, and performing all work necessary to furnish, transport, and place any pilings that require additional length due to unforeseen soil conditions within the observation walkway construction area or pile warning sign locations as specified by the project and specification or as requested by Contracting Officers until acceptance by the Contracting Officer.

Payment will be on the basis of length of piling from cutoff elevation to final tip elevation. Should the total number of piles or number of each length vary from that specified, an adjustment in the contract price and the time for completion will be made. If excavation is made adjacent to piling and below the grade indicated and if piling is driven before backfilling of over-excavation, no payment will be made for the length of piling equal to the depth of the over-excavation. No additional payment will be made for cutting off piles, for any portion of a pile remaining above the cutoff elevation, or for broken, damaged, or rejected piles.

Payment for piles driven in required lengths greater than 50 feet will be made at an adjusted unit price.

1.5.1.2 Measurement

The total material to be paid for under the contract will be measured by the additional linear foot, in place.

1.5.2 Additional Aggregate Base Course (Item 0011)

Payment for additional aggregate base course shall be made in accordance with Item No. 0011, Additional Aggregate Base Course, which shall include all costs for placement, equipment, labor, and performing all work necessary to furnish, transport, and place additional aggregate base course, above and beyond the quantity defined in Item 0006, Aggregate Base Course, due to unforeseen depth conditions within the existing pavement as specified by the project and specification or as requested by Contracting Officers until acceptance by the Contracting Officer.

1.5.2.1 Measurement

Payment will be on the basis of cubic yard of additional material.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

SECTION 01312

RESIDENT MANAGEMENT SYSTEM (RMS)

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.2 GENERAL

The Government will use the Resident Management System for Windows (RMS-W) to assist in its monitoring and administration of this contract. The Contractor shall use the Government-furnished Construction Contractor Module of RMS-Windows, referred to as RMS-QC (QC for Quality Control), to record, maintain, and submit various information throughout the contract period. This joint Government-Contractor use of RMS-W and RMS-QC will facilitate electronic exchange of information and overall management of the contract. RMS-QC provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Import/Export of Data

1.2.1 Correspondence and Electronic Communications

For ease and speed of communications, both Government and Contractor will, to the maximum extent feasible, exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record shall also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.2 Other Factors

Particular attention is directed to Section 01320, "Project Schedule", Section 01330, SUBMITTAL PROCEDURES, and Section 01451, CONTRACTOR QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through RMS-QC. Also, there is no separate payment for establishing and maintaining the RMS-QC database; all costs associated

therewith shall be included in the contract pricing for the work.

1.3 RMS-QC SOFTWARE

RMS-QC is a Windows-based program that can be run on a stand-alone personal computer or on a network. The Government will make available the RMS-QC software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor shall be responsible to download, install and use the latest version of the RMS-QC software from the Government's RMS Internet Website. Upon specific justification and request by the Contractor, the Government can provide RMS-QC on 3-1/2" high-density diskettes or CD-ROM. Any program updates of RMS-QC will be made available to the Contractor via the Government RMS Website as they become available.

1.4 SYSTEM REQUIREMENTS

The following listed hardware and software is the minimum system configuration that the Contractor shall have to run RMS-QC:

Hardware

IBM-compatible PC with 200 MHz Pentium or higher processor

32+ MB RAM

4 GB hard drive disk space for sole use by the RMS-QC system

3 1/2 inch high-density floppy drive

Compact disk (CD) Reader

Color monitor

Laser printer compatible with HP LaserJet III or better, with minimum 4 MB installed memory.

Connection to the Internet, minimum 28 BPS

Software

Microsoft (MS) Access 97 or newer version database software

MS Windows 95 or newer version operating system (MS Windows NT 4.0 or newer is recommended)

Word Processing software compatible with MS Word 97 or newer

Internet browser

The Contractor's computer system shall be protected by virus protection software that is regularly upgraded with all issued manufacturer's updates throughout the life of the contract.

Electronic mail (E-mail) compatible with MS Outlook

1.5 RELATED INFORMATION

1.5.1 RMS-QC User Guide

After contract award, the Contractor shall download instructions for the installation and use of RMS-QC from the Government RMS Internet Website; the Contractor can obtain the current address from the Government. In case of justifiable difficulties, the Government will provide the Contractor with a CD-ROM containing these instructions.

1.5.2 Contractor Quality Control(CQC) Training

The use of RMS-QC will be discussed with the Contractor's QC System Manager during the mandatory CQC Training class.

1.5.3 Video Training for RMS-QC

After contract award, the Contractor will be provided with a CD containing a training video on the use of RMS-QC.

1.6 CONTRACT DATABASE

Prior to the pre-construction conference, the Government shall provide the Contractor with basic contract award data to use for RMS-QC. The Government will provide data updates to the Contractor as needed, generally by files attached to E-mail. These updates will generally consist of submittal reviews, correspondence status, QA comments, and other administrative and QA data.

1.7 DATABASE MAINTENANCE

The Contractor shall establish, maintain, and update data for the contract in the RMS-QC database throughout the duration of the contract. The Contractor shall establish and maintain the RMS-QC database at the Contractor's site office. Data updates to the Government shall be submitted by E-mail with file attachments, e.g., daily reports, schedule updates, payment requests. If permitted by the Contracting Officer, a data diskette or CD-ROM may be used instead of E-mail (see Paragraph DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM). The RMS-QC database typically shall include current data on the following items:

1.7.1 Administration

1.7.1.1 Contractor Information

The database shall contain the Contractor's name, address, telephone numbers, management staff, and other required items. Within 14 calendar days of receipt of RMS-QC software from the Government, the Contractor shall deliver Contractor administrative data in electronic format via E-mail.

1.7.1.2 Subcontractor Information

The database shall contain the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor must be listed separately for each trade to be performed. Each subcontractor/trade shall be assigned a unique Responsibility Code, provided in RMS-QC. Within 14 calendar days of receipt of RMS-QC software from the Government, the Contractor shall deliver subcontractor administrative data in electronic format via E-mail.

1.7.1.3 Correspondence

All Contractor correspondence to the Government shall be identified with a serial number. Correspondence initiated by the Contractor's site office shall be prefixed with "S". Letters initiated by the Contractor's home (main) office shall be prefixed with "H". Letters shall be numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

1.7.1.4 Requests for Information

RMS-QC includes a means for the Contractor to enter, log, and transmit requests for information (RFI) to the Government. RFIs can be exchanged electronically using the import/export functions of RMS-QC. The Contractor shall also provide the Government with a signed, printed copy of each RFI. All RFIs from the Contractor to the Government shall have the prefix "RFI" and shall be numbered sequentially beginning with RFI-0001.

1.7.1.5 Equipment

The Contractor's RMS-QC database shall contain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.7.1.6 EM 385-1-1, Corps of Engineers Safety Manual and RMS Linkage

Upon request, the Contractor can obtain a copy of the current version of the Safety Manual, EM 385-1-1, on CD. Data on the CD will be accessible through RMS-QC, or in stand-alone mode.

1.7.1.7 Management Reporting

RMS-QC includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of RMS-QC. Among these reports are: Progress Payment Request worksheet, QA/QC comments, Submittal Register Status, Three-Phase Inspection checklists.

1.7.2 Finances

1.7.2.1 Pay Activity Data

The RMS-QC database shall include a list of pay activities that the Contractor shall develop in conjunction with the construction schedule. The sum of all pay activities shall be equal to the total contract amount, including modifications. Pay activities shall be grouped by Contract Line Item Number (CLIN), and the sum of the activities shall equal the amount of each CLIN. The total of all CLINs equals the Contract Amount.

1.7.2.2 Payment Requests

All progress payment requests shall be prepared using RMS-QC. The Contractor shall complete the payment request worksheet and include it with the payment request. The work completed under the contract, measured as percent or as specific quantities, shall be updated at least monthly. After the update, the Contractor shall generate a payment request report using RMS-QC. The Contractor shall submit the payment requests with supporting data by E-mail with file attachment(s). If permitted by the Contracting Officer, a data diskette may be used instead of E-mail. A

signed paper copy of the approved payment request is also required, which shall govern in the event of discrepancy with the electronic version.

1.7.3 Quality Control (QC)

RMS-QC provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other contractor QC requirements. The Contractor shall maintain this data on a daily basis. Entered data will automatically output to the RMS-QC generated daily report. The Contractor shall provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01451, CONTRACTOR QUALITY CONTROL. Within seven calendar days of Government acceptance, the Contractor shall submit a data diskette or CD-ROM reflecting the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

1.7.3.1 Daily Contractor Quality Control (CQC) Reports.

RMS-QC includes the means to produce the Daily CQC Report. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by RMS-QC shall be the Contractor's official report. Data from any supplemental reports by the Contractor shall be summarized and consolidated onto the RMS-QC-generated Daily CQC Report. Daily CQC Reports shall be submitted as required by Section 01451, CONTRACTOR QUALITY CONTROL. Reports shall be submitted electronically to the Government using E-mail or diskette within 24 hours after the date covered by the report. Use of either mode of submittal shall be coordinated with the government representative. The Contractor shall also provide the Government a signed, printed copy of the daily CQC report.

1.7.3.2 Deficiency Tracking.

The Contractor shall use RMS-QC to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using QC Comments. The contractor shall maintain a current log of its QC comments in the RMS-QC database. The Government will log the deficiencies it has identified using its QA comments. The Government's QA comments will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of both QC and QA comments.

1.7.3.3 Three-Phase Control Meetings

The Contractor shall maintain scheduled and actual dates and times of preparatory and initial control meetings in RMS-QC.

1.7.3.4 Accident/Safety Tracking.

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. The Contractor shall regularly update the correction status of the safety comments. In addition, the Contractor shall utilize RMS-QC to advise the Government of any accidents occurring on the jobsite. This brief supplemental entry is not to be considered as a substitute for completion of mandatory reports, e.g., ENG Form 3394 and OSHA Form 200.

1.7.3.5 Features of Work

The Contractor shall include a complete list of the features of work in the RMS-QC database. A feature of work may be associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

1.7.3.6 QC Requirements

The Contractor shall develop and maintain a complete list of QC testing, transferred and installed property, and user training requirements in RMS-QC. The Contractor shall update all data on these QC requirements as work progresses, and shall promptly provide this information to the Government via RMS-QC.

1.7.4 Submittal Management

The Government will provide the initial submittal register, ENG Form 4288, SUBMITTAL REGISTER, in electronic format. Thereafter, the Contractor shall maintain a complete list of all submittals, including completion of all data columns as described in Section 01330, SUBMITTAL PROCEDURES. Dates on which submittals are received and returned by the Government will be included in its export file to the Contractor. The Contractor shall use RMS-QC to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update, ENG Form 4288, shall be produced using RMS-QC. RMS will be used to update, store and exchange submittal registers and transmittals, but will not be used for storage of actual submittals.

1.7.5 Schedule

The Contractor shall develop a construction schedule consisting of pay activities, in accordance Section 01320, PROJECT SCHEDULE. This schedule shall be input and maintained in the RMS-QC database either manually or by using the Standard Data Exchange Format (SDEF) (see Section 01320 PROJECT SCHEDULE). The updated schedule data shall be included with each pay request submitted by the Contractor.

1.7.6 Import/Export of Data

RMS-QC includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data, and schedule data using SDEF.

1.8 IMPLEMENTATION

Contractor use of RMS-QC as described in the preceding paragraphs is mandatory. The Contractor shall ensure that sufficient resources are available to maintain its RMS-QC database, and to provide the Government with regular database updates. RMS-QC shall be an integral part of the Contractor's management of quality control.

1.9 DATA SUBMISSION VIA COMPUTER DISKETTE OR CD-ROM

The Government-preferred method for Contractor's submission of updates, payment requests, correspondence and other data is by E-mail with file attachment(s). For locations where this is not feasible, the Contracting Officer may permit use of computer diskettes or CD-ROM for data transfer. Data on the disks or CDs shall be exported using the RMS-QC built-in export function. If used, diskettes and CD-ROMs will be submitted in accordance

with the following:

1.9.1 File Medium

The Contractor shall submit required data on 3-1/2" double-sided high-density diskettes formatted to hold 1.44 MB of data, capable of running under Microsoft Windows 95 or newer. Alternatively, CD-ROMs may be used. They shall conform to industry standards used in the United States. All data shall be provided in English.

1.9.2 Disk or CD-ROM Labels

The Contractor shall affix a permanent exterior label to each diskette and CD-ROM submitted. The label shall indicate in English, the RMS-QC file name, full contract number, project name, project location, data date, name and telephone number of person responsible for the data.

1.9.3 File Names

The Government will provide the file names to be used by the Contractor with the RMS-QC software.

1.10 MONTHLY COORDINATION MEETING

The Contractor shall update the RMS-QC database each workday. At least monthly, the Contractor shall generate and submit an export file to the Government with schedule update and progress payment request. At least one week prior to submittal, the contractor shall meet with the Government representative to review the planned progress payment data submission for errors and omissions.
The contractor shall make all required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will be returned. The Government will not process progress payments until an acceptable RMS-QC export file is received.

1.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification.

PART 2 PRODUCTS

PART 3 EXECUTION

-- End of Section --

SECTION 01320

PROJECT SCHEDULE

PART 1 GENERAL

1.1 REFERENCE

The publications listed below form a part of the specification to the extent referenced. The publications are referenced in the text by basic designation only.

ENGINEERING REGULATIONS (ER)

ER 1-1-11	(1995) Progress, Schedules, and Network Analysis Systems

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Schedules

Initial Project Schedule; G, ED.
Preliminary Project Schedule; G, ED.
Periodic Schedule Updates; G, ED.

Three copies of the schedules showing codes, values, categories, numbers, items, etc., as required.

SD-08 Statements

Qualifications; G, ED.

Documentation showing qualifications of personnel preparing schedule reports.

SD-09 Reports

Narrative Report; G, ED.
Schedule Reports; G, ED.

Three copies of the reports showing numbers, descriptions, dates, float, starts, finishes, durations, sequences, etc., as required.

1.3 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A Project Schedule as described below shall be prepared. The scheduling of construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel will result in an inability of the Contracting Officer to evaluate Contractor's progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the Project Schedule, then the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in the Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

The Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule.

3.3.2.1 Activity Durations

Contractor submissions shall follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods (usually less than 2 percent of all non-procurement

activities' Original Durations are greater than 20 days).

3.3.2.2 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, and delivery.

3.3.2.3 Government Activities

Government and other agency activities that could impact progress shall be shown. These activities include, but are not limited to: approvals, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.

3.3.2.4 Work Areas

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

3.3.2.5 Modification or Claim Number

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number. Whenever possible, changes shall be added to the schedule by adding new activities. Existing activities shall not normally be changed to reflect modifications.

3.3.2.6 Phase of Work

All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not contain work in more than one phase of work. The project phase of each activity shall be by the unique Phase of Work Code.

3.3.2.7 Category of Work

All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited, to the procurement chain of activities including such items as submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

3.3.2.8 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.3 Scheduled Project Completion

The schedule interval shall extend from Notice-to-Proceed to the contract completion date.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date on which the Notice to Proceed (NTP) was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have: an "ES" constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity call "End Project". The "End Project" activity shall have: an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted in the narrative report at every project schedule update period to assist the Contracting Officer in evaluating the Contractor's ability to actually complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1 Start Phase

The Contractor shall include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have: an "ES" constraint date equal to the date on which NTP was acknowledged, and a zero day duration.

3.3.4.2 End Phase

The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have: an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.4.3 Phase X

The Contractor shall include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in

the phase.

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in-progress or completed activity and failure to ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes.

3.3.6 Out-of-Sequence Progress

Activities that have posted progress without all preceding logic being satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case approval of the Contracting Officer. The Contractor shall propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule.

3.3.7 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Preliminary Project Schedule Submission

The Preliminary Project Schedule, defining the Contractor's planned operations for the first 60 calendar days shall be submitted for approval within 20 calendar days after Notice to Proceed is acknowledged. The approved preliminary schedule shall be used for payment purposes not to exceed 60 calendar days after Notice to Proceed.

3.4.2 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 40 calendar days after Notice to Proceed. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail.

3.4.3 Periodic Schedule Updates

Based on the result of progress meetings, specified in "Periodic Progress Meetings," the Contractor shall submit periodic schedule updates. These submissions shall enable the Contracting Officer or to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer or authorized representative, is necessary for verifying the contractor's progress, the Contractor shall be deemed not to have provided

an estimate upon which progress payment may be made.

3.4.4 Standard Activity Coding Dictionary

The Contractor shall use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11, Appendix A. This exact structure is mandatory, even if some fields are not used.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the preliminary submission, and every periodic project schedule update throughout the life of the project:

3.5.1 Data Disks

Two data disks containing the project schedule shall be provided. Data on the disks shall adhere to the SDEF format specified in ER 1-1-11, Appendix A.

3.5.1.1 File Medium

Required data shall be submitted on 3.5 disks, formatted to hold 1.44 MB of data, under the MS-DOS Version 5. or 6.x, unless otherwise approved by the Contracting Officer.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Preliminary, Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number or person responsible for the schedule, and the MS-DOS version used to format the disk.

3.5.1.3 File Name

Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with the preliminary, initial,and each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the 2 most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to relay to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the schedule submission. The

Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number.

3.5.4.2 Logic Report

A list of Preceding and Succeeding activities for every activity in ascending order by activity number. Preceeding and succeeding activities shall include all information listed above in paragraph Schedule Reports. A blank line shall be left between each activity grouping.

3.5.4.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates. Completed activities shall not be shownon this report.

3.5.4.4 Earnings Report

A compilation of the Contractor's Total Earnings on the project from the Notice to Proceed until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer at the most recent Monthly Progress Meeting. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by bid item and sorted by activity numbers. This report shall: sum all activities in a bid item and provide a bid item percent; and complete and sum all bid items to provide a total project percent complete. The printed report shall contain, for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost) and Earnings to Date.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission and on monthly schedule update submissions. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows

from right to left. The activity number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly onsite meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will approve activity progress, proposed revisions, and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date shall be subject to the approval of the Contracting Officer. As a minimum, the Contractor shall address the following items on an activity by activity basis, during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish dates for each activity currently in-progress or completed.

3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations must be based on Remaining Duration for each activity.

3.6.3.3 Cost Completion

The earnings for each activity started. Payment will be based on earnings for each in-progress or completed activity. Payment for individual activities will not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.3.4 Logic Changes

All logic changes pertaining to Notice to Proceed on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary. 3) Changes required to correct a schedule which does not represent the actual plan prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, or any interim milestone date, the Contractor shall furnish the following for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, will not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of under 2 weeks based upon the most recent schedule update at the time of the Notice to Proceed or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

a. A list of affected activities, with their associated project schedule activity number.

b. A brief explanation of the causes of the change.

c. An analysis of the overall impact of the changes proposed.

d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

For any requested time extension of over 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If Notice to Proceed (NTP) is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, the Contractor shall advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

-- End of Section --

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUBMITTAL IDENTIFICATION

Submittals required are identified by SD numbers as follows:

SD-01 Data

SD-04 Drawings

SD-07 Schedules

SD-08 Statements

SD-09 Reports

SD-13 Certificates

SD-14 Samples

SD-18 Records

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.2.1 Government Approved

Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. These items, as determined by the Contracting Officer, are considered to be "shop drawings."

1.2.2 Information Only

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings". Submittal Register ENG FORM 4288, column labeled "Reviewer", this column is blank and is understood that the reviewer is "AR" (Area Office).

1.3 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the CQC requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered

unless accompanied by an explanation of why a substitution is necessary.

1.4 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a written notice shall be given promptly to the Contracting Officer.

1.5 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) representative and each item shall be stamped, signed, and dated by the CQC representative indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

3.2 SUBMITTAL REGISTER (ENG FORM 4288)

At the end of this section is one set of ENG Form 4288 listing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. The Contractor will also be given the submittal register files, containing the computerized ENG Form 4288 and instructions on the use of the files. These submittal register files will be furnished on a separate diskette. Columns "d" through "r" have been completed by the Government; the Contractor shall complete columns "a" and "s" through "u" and submit the forms (hard copy plus associated electronic file) to the Contracting Officer for approval within 30 calendar days after Notice to Proceed. The Contractor shall keep this diskette up-to-date and shall submit it to the Government together with the monthly payment request. The approved submittal register will become the scheduling

document and will be used to control submittals throughout the life of the contract. The submittal register and the progress schedules shall be coordinated.

3.3 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 30 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

3.4 TRANSMITTAL FORM (ENG FORM 4025)

The transmittal form (ENG Form 4025) shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

3.5 SUBMITTAL PROCEDURE

Six (6) copies of submittals shall be made as follows:

3.5.1 Procedures

In the signature block provided on ENG Form 4025 the Contractor certifies that each item has been reviewed in detail and is correct and is in strict conformance with the contract drawings and specifications unless noted otherwise. The accuracy and completeness of submittals is the responsibility of the Contractor. Any costs due to resubmittal of documents caused by inaccuracy, lack of coordination, and/or checking shall be the responsibility of the Contractor. This shall include the handling and review time on the part of the Government. Each variation from the contract specifications and drawings shall be noted on the form; and, attached to the form, the Contractor shall set forth, in writing, the reason for and description of such variations. If these requirements are not met, the submittal may be returned for corrective action.

3.5.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.6 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

3.7 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. Four (4) copies of the submittal will be retained by the Contracting Officer and two (2) copies of the submittal will be returned to the Contractor.

3.8 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

3.9 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR

(Firm Name)

_____ Approved

_____ Approved with corrections as noted on submittal data and/or attached sheets(s).

SIGNATURE: _____

TITLE: _____

DATE: _____

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.
Project #

TITLE AND LOCATION
SALTMARSH RESTORATION

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01010	SD-01 Preconstruction Submittals														
			CQC Program	1.4.1	G ED												
			SD-07 Certificates														
			Progress Schedule	1.1.1	G ED												
			SD-09 Manufacturer's Field														
			Reports														
			OSHA Log	1.3.1.4	FIO												
			CQC Program	1.4.1	G ED												
			Checklist	1.2.3	G ED												
			Burning	1.6.4	G ED												
			Photographs	1.1.5	FIO												
			Sample Tags	1.7.1.2	FIO												
		01320	SD-08 Manufacturer's Instructions														
			Qualifications	1.3	G ED												
		01355	SD-04 Samples														
			Environmental Protection Plan	1.7	G ED												
		01510	SD-01 Preconstruction Submittals														
			Temporary Electrical Work	1.9	G ED												
			As-Built Drawings	1.2.1.4	G ED												
			As-Built Record of Equipment and Materials	1.2.2	FIO												
			Warranty Management Plan	1.3.1	G ED												
			Final Clean-Up	1.4	FIO												
		02220	SD-01 Preconstruction Submittals														
			Work Plan	1.5.4	G ED												
		02300	SD-01 Preconstruction Submittals														

SUBMITTAL REGISTER

CONTRACT NO.
Project #

TITLE AND LOCATION
SALTMARSH RESTORATION

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02300	Earthwork	3.11	G ED												
			Testing	3.11	G ED												
			Geotextile	2.1.1	G ED												
			Geotextile	2.1.1	G ED												
		02457	SD-01 Preconstruction Submittals														
			Pile Driving Equipment	3.3	G												
			SD-04 Samples														
			Installation	3.2	G ED												
			Pile Driving	3.2.2	G ED												
			SD-09 Manufacturer's Field														
			Reports														
			Pile Driving Records	3.4	G ED												
			Grading and Marking	3.1	G												
			Field Tests and Inspections	3.6	G ED												
		02486	SD-01 Preconstruction Submittals														
			Stone Source	2.2	G ED												
			Stone Material Control	1.4	G ED												
			Placement Methods	3.2.1	G ED												
			Stone Testing	2.3.2	G												
			Stone Quality Control Testing	2.1.6	G												
			SD-09 Manufacturer's Field														
			Reports														
			Quality Control	1.7	G												
			Stone Material Control (SMC)	1.6	G												
			Reports														
			Stone Samples	2.3.2	G												

SUBMITTAL REGISTER

CONTRACT NO.
Project #

TITLE AND LOCATION
SALTMARSH RESTORATION

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY						
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02630	Pipeline Testing	3.6	FIO												
			Determination of Density	3.5.5	FIO												
		02722	SD-01 Preconstruction Submittals														
			Plant, Equipment, and Tools	1.7	G												
			Certified Waybills and Certified	3.2	G ED												
			Delivery Tickets														
			SD-09 Manufacturer's Field														
			Reports														
			Sampling and testing	1.5	G												
			Field Density Tests	1.5.2.4	G												
		02921	SD-01 Preconstruction Submittals														
			Surface Erosion Control Material	3.4.1	G ED												
			Chemical Treatment Material	1.4.3	G												
			Equipment	2.4.1	FIO												
			Equipment	3.3.1.2	FIO												
			Equipment	3.3.3.2	FIO												
			Equipment	3.3.3.4	FIO												
			Delivery	1.4.1	G												
			Finished Grade and Topsoil	3.2.1	G												
			Topsoil	2.2	G ED												
			Quantity Check	3.5	FIO												
			Seed Establishment Period	3.8	FIO												
			Maintenance Record	3.8.3.4	FIO												
			SD-09 Manufacturer's Field														
			Reports														
			Equipment Calibration	3.1.3	FIO												

SUBMITTAL REGISTER

CONTRACT NO.
Project #

TITLE AND LOCATION
SALTMARSH RESTORATION

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02921	Soil Test	3.1.4	G													
			Seed	2.1	G	ED												
			Topsoil	2.2	G	ED												
			pH Adjuster	2.3.1	G	ED												
			Fertilizer	2.3.2	G	ED												
			Soil Conditioner	2.3.3	FIO													
			Mulch	2.4	FIO													
			Delivered Topsoil	1.4.1.1	FIO													
			Delivered Topsoil	3.1.4	FIO													
			Soil Amendments	2.3	FIO													
			Mulch	2.4	FIO													
		06100	SD-01 Preconstruction Submittals															
			Hardware	2.2	FIO													
			Grading and Marking	2.1.1	G													

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE

(Read instructions on the reverse side prior to initiating this form)

DATE	TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:	FROM:	CONTRACT NO.	CHECK ONE: ☐ THIS IS A NEW TRANSMITTAL ☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____
SPECIFICATION SEC. NO. *(Cover only one section with each transmittal)*	PROJECT TITLE AND LOCATION		

ITEM NO. *a.*	DESCRIPTION OF ITEM SUBMITTED *(Type size, model number/etc.)* *b.*	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. *(See instruction no. 8)* *c.*	NO. OF COPIES *d.*	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE *g.*	VARIATION *(See instruction No. 6)* *h.*	FOR CE USE CODE *i.*
				SPEC. PARA. NO. *e.*	DRAWING SHEET NO. *f.*			

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated.

NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED *(List by Item No.)*	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.

3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288 for each entry on this form.

4. Submittals requiring expeditious handling will be submitted on a separate form.

5. Separate transmittal form will be used for submittals under separate sections of the specifications.

6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".

7. Form is self-transmittal, letter of transmittal is not required.

8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.

9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A	--	Approved as submitted.	E	--	Disapproved (See attached).
B	--	Approved, except as noted on drawings.	F	--	Receipt acknowledged.
C	--	Approved, except as noted on drawings. Refer to attached sheet resubmission required.	FX	--	Receipt acknowledged, does not comply as noted with contract requirements.
D	--	Will be returned by separate correspondence.	G	--	Other *(Specify)*

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

SECTION 01355

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

33 CFR 328	Definitions
40 CFR 68	Chemical Accident Prevention Provisions
40 CFR 152 - 186	Pesticide Programs
40 CFR 279	Standards for the Management of Used Oil
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

CORPS OF ENGINEERS (COE)

WETLAND MANUAL	Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and

liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.4 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.5 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers,creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.2.6 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.7 Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with WETLAND MANUAL.

1.3 GENERAL REQUIREMENTS

The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.5 PAYMENT

No separate payment will be made for work covered under this section. The Contractor shall be responsible for payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor. All costs associated with this section shall be included in the contract price. The Contractor shall be responsible for payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-04 Drawings

Environmental Protection Plan; G, ED

The environmental protection plan.

1.7 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Environmental Protection Plan shall be current and maintained onsite by the Contractor.

1.7.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

1.7.2 Contents

The environmental protection plan shall include, but shall not be limited to, the following:

a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations.

f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, material storage areas, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.

i. A Spill Control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1. This plan shall include as a minimum:

1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Contracting Officer and Facility Environmental Office in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. Training requirements for Contractor's personnel and methods of accomplishing the training.

4. A list of materials and equipment to be immediately available

at the job site, tailored to cleanup work of the potential hazard(s) identified.

5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

6. The methods and procedures to be used for expeditious contaminant cleanup.

j. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. The Contractor shall attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. The report shall be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and shall be for the previous quarter (e.g. the first working day of January, April, July, and October). The report shall indicate the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

k. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

l. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.

m. A historical, archaeological, and biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological and biological resources and wetlands known to be on the project site: and/or identifies procedures to be followed if historical, archaeological, and biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. The plan shall include methods to assure the protection of known or discovered resources and shall identify lines of communication between Contractor personnel and the Contracting Officer.

1.7.3 Appendix

Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached, as an appendix, to the Environmental

Protection Plan.

1.8 PROTECTION FEATURES

Prior to start of any onsite construction activities, the Contractor and the Contracting Officer shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report shall be signed by both the Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the Contractor's work under the contract.

1.9 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings,plans and specifications which may have an environmental impact will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.10 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS AND COMMITMENTS

Prior to commencement of work, the Contractor is to confirm with the Contracting Officer that all environmental permits are approved and that construction may begin. The Contracting Officer shall provide the Contractor with three (3) copies of all environmental permits that are the responsibilty of the Government. The Contractor is to attach any environmental permits to his Environmental Plan, as previously stated.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the

drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.

3.2.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary erosion and sediment control best management practices (BMPs) as indicated on the drawings. BMPs may include, but not be limited to, vegetation cover, slope stabilization, silt fences, sediment traps, inlet and outfall protection, and diversion channels. Any temporary measures shall be removed after the area has been stabilized.

3.2.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.3.1 Wetlands

The Contractor shall not enter, disturb, destroy, or allow discharge of contaminants into any wetlands. The Contractor shall be responsible for the protection of wetlands shown on the drawings in accordance with paragraph ENVIRONMENTAL PERMITS, REVIEWS, AND APPROVALS. Authorization to enter specific wetlands identified shall not relieve the Contractor from any obligation to protect other wetlands within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.4 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall maintain stockpiles, haul roads, temporary access roads, plant sites, spoil areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.4.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.4.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with the provisions of the State of Maryland rules and regulations.

3.4.4 Burning

Burning will not be allowed on the project site unless specified in other

sections of the specifications or authorized in writing by the Contracting Officer. The specific time, location, and manner of burning shall be subject to approval.

3.5 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.5.1 Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. Waste materials shall be hauled to a landfill site as approved by the Contracting Officer. The Contractor shall comply with site procedures pertaining to the use of landfill areas.

3.5.2 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. Storage of fuel on the project site shall be in accordance with all Federal, State, and local laws and regulations.

3.6 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT

The Contractor shall maintain an inventory of non-hazardous solid waste diversion and disposal of construction and demolition debris. The Contractor shall submit a report to the Facility through the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that non-hazardous solid waste has been generated. The following shall be included in the report:

a. Construction and Demolition (C&D) Debris Disposed in cubic yards or tons, as appropriate.

b. Construction and Demolition (C&D) Debris Recycled in cubic yards or tons, as appropriate.

c. Total C&D Debris Generated in cubic yards or tons, as appropriate.

d. Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount) in cubic yards or tons, as appropriate.

3.7 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or

burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.8 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

3.9 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor shall coordinate with the Contracting Officer at the earliest possible time prior to any pesticide application. Pest Management personnel shall be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. The use and management of pesticides are regulated under 40 CFR 152 - 186.

3.10 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.

3.11 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.12 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.13 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction. The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

-- End of Section --

SECTION 01451

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740	(1999b) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(1998a) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2 QUALITY CONTROL PLAN

The Contractor shall furnish for review by the Government, not later than 15

calendar days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan. The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 60 calendar days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be approved by the Contracting Officer.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 14 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager shall receive direction and authority from the CQC System Manager and shall serve as a member of the CQC staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization.The Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor

shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, show drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a construction person with a minimum of 7 years in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned as System Manager but may have duties as project superintendent in addition to quality control. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: civil, surveying, materials technician, submittals clerk . These individuals may be employees of the prime or subcontractor; be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan.

Experience Matrix

	Area	Qualifications
a.	Civil	Graduate Civil Engineer with 2 years experience in the type of work being performed on this project or technician with 5 yrs related experience
b.	Surveyor	Surveyor licensed in the State of Maryland with a minimum 2 years experience.
c.	Submittals	Submittal Clerk with 1 yr experience
d.	Concrete, Pavements and Soils	Materials Technician with 2 yrs experience for the appropriate area

Experience Matrix

Area	Qualifications

3.4.4 Additional Requirement

In addition to the above experience and/or education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors".

3.4.5 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

a. A review of each paragraph of applicable specifications, reference codes, and standards. A copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by Government personnel until final acceptance of the work.

b. A review of the contract drawings.

c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. A review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government shall be notified at least 72 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government shall be notified at least 72 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers validated testing laboratory or establish a validated testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of $1,500.00 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

The Contractor is responsible for locating and subcontracting an independent testing laboratory for all samples and materials. The testing laboratory is subject to validation by the Contracting Officer. All costs incidential to the testing and transportation of samples or materials shall be borne by the Contractor.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the Special Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. A punch list of items which do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is

divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Fort Story Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 calendar days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost.

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.

g. Offsite surveillance activities, if applicable, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

Sample forms shall be provided by the Government.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

-- End of Section --

Contractor's Name: _____
Address: _____
_____
Phone Number: _____

CONSTRUCTION QUALITY CONTROL REPORT

PROJECT NAME: _____
LOCATION:_____ DATE: _____
CONTRACT NUMBER:_____ REPORT NO.:_____

SUPERINTENDENT:_____

TYPE OF WORKERS	NUMBER	TYPES OF CONSTRUCTION EQUIPMENT ON SITE	NUMBER

SUBCONTRACTORS

COMPANY	RESPONSIBILITY	FOREMAN	NO. OF WORKERS

TOTALS

NO. OF WORKERS TODAY	MANHOURS TODAY	MANHOURS FOR THIS PERIOD

CONTRACT MATERIALS AND EQUIPMENT DELIVERED TO SITE:

WEATHER:_____ SITE CONDITIONS:_____

DID A DELAY OR WORK STOPPAGE OCCUR TODAY? _____
IF YES, EXPLAIN.

HAS ANYTHING DEVELOPED IN THE WORK WHICH MAY LEAD TO A CHANGE
OR FINDING OF FACT? _____ IF YES, EXPLAIN.

DESCRIPTION OF ALL WORK PERFORMED TODAY
(LIST BY DEFINABLE FEATURES OF WORK)

PREPARATORY INSPECTION:

LIST ALL INSPECTIONS BY SUBJECT AND SPECIFICATION LOCATION.
ATTACH MINUTES OF MEETING AND LIST OF ALL ATTENDEES.

HAVE ALL REQUIRED SUBMITTALS AND SAMPLES OF CONSTRUCTION BEEN APPROVED.

DO THE MATERIALS AND EQUIPMENT TO BE USED CONFORM TO THE SUBMITTALS?

HAS ALL PRELIMINARY WORK BEEN INSPECTED, TESTED, AND COMPLETED?

TEST REQUIRED AND INSPECTION TECHNIQUES TO BE EXECUTED TO PROVE CONTRACT COMPLIANCE (INCLUDE BOTH EXPECTED AND ACTUAL RESULTS)

HAS A PHASE HAZARD ANALYSIS BEEN PERFORMED?

COMMENTS AND DEFICIENCIES NOTED AND CORRECTIVE ACTIONS TAKEN:

ALL INSTRUCTIONS RECEIVED FROM QA PERSONNEL AND ACTIONS TAKEN:

JOB SAFETY (INCLUDE MEETINGS HELD AND DEFICIENCIES NOTED WITH CORRECTIVE ACTIONS):

INITIAL INSPECTION:

LIST ALL INSPECTIONS BY SUBJECT AND SPECIFICATION LOCATION. COMMENTS AND/OR DEFICIENCIES NOTED AND CORRECTIVE ACTION TAKEN:

FOLLOW-UP INSPECTION:

LIST ALL INSPECTIONS BY SUBJECT AND SPECIFICATION LOCATION. COMMENTS AND/OR DEFICIENCIES NOTED AND CORRECTIVE ACTION TAKEN.

SIGNATURE:_____
QUALITY CONTROL REPRESENTATIVE/MANAGER

THE ABOVE REPORT IS COMPLETE AND CORRECT. ALL MATERIALS AND EQUIPMENT USED AND ALL WORK PERFORMED DURING THIS REPORTING PERIOD ARE IN COMPLIANCE WITH THE CONTRACT SPECIFICATIONS, AND SUBMITTALS, EXCEPT AS NOTED ABOVE.

SIGNATURE:_____
CONTRACTOR'S APPROVED AUTHORIZED REPRESENTATIVE

SECTION 01510

TEMPORARY CONSTRUCTION ITEMS

PART 1 GENERAL

1.1 GENERAL

The work covered by this section consists of furnishing all labor, materials, equipment, and services and performing all work required for or incidental to the items herein specified. No separate payment will be made for the construction and services required by this section, and all costs in connection therewith shall be included in the overall cost of the work unless specifically stated otherwise.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Temporary Electrical Work; G, ED.

The Contractor shall submit a temporary power distribution sketch prior to the installation of any temporary power.

1.4 IDENTIFICATION OF EMPLOYEES

The Contractor shall be responsible for furnishing to each employee, and for requiring each employee engaged on the work to display, identification as approved and directed by the Contracting Officer. Prescribed identification shall immediately be delivered to the Contracting Officer for cancellation upon release of any employee. When required, the Contractor shall obtain and provide fingerprints of persons employed on the project. Contractor and subcontractor personnel shall wear identifying markings on hard hats clearly identifying the company for whom the employee works.

1.5 EMPLOYEE PARKING

Contractor employees shall park privately owned vehicles in an area

designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site.

1.6 PROJECT SIGN: (AUG 1974)

A project sign shall be provided and erected at a location designated by the Contracting Officer. The sign shall conform to the requirements as shown on the drawings. The sign shall be erected as soon as possible and within 15 days after the date of receipt of notice to proceed. Upon completion of the project, the sign shall be removed and disposed of by the Contractor. (CENAB)

1.7 SAFETY SIGN (AUG 1974)

A safety sign shall be provided and erected at a location designated by the Contracting Officer. The sign shall conform to the requirements as shown on the the drawings. The sign shall be erected as soon as possible and within 15 days after the date of receipt of notice to proceed. The data required by the sign shall be corrected daily, with light colored metallic or non-metallic numerals. Numerals, including mounting hardware, shall be subject to the approval of the Contracting Officer. Upon completion of the project, the sign shall be removed and disposed of by the Contractor. (CENAB)

1.8 ORANGE SAFETY FENCING

The fence shall be installed around the delineated wetland protection area prior to starting the work. The safety fencing shall be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 42 inches high, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved location. The safety fencing shall be maintained by the Contractor during the life of the contract and, upon completion and acceptance of the work, shall become the property of the Contractor and shall be removed from the work site.

1.9 TEMPORARY ELECTRICAL WORK: (APR 1962 REV JUL 2000)

Temporary electrical work shall be in accordance with Sections 7 and 11 of EM 385-1-1 U.S. Army Corps of Engineers Safety and Health Requirements Manual. The Contractor shall submit for approval a temporary power distribution sketch prior to the installation of any temporary power. The sketch shall include location, voltages, and means of protection for all temporary distribution system wiring and components to include lighting, receptacles, grounding, disconnecting means, and GFCIs. The Contractor shall test the temporary power system and devices for polarity, ground continuity, and ground resistance prior to the initial use and before use after any modification. The Contractor shall verify to the satisfaction of the Contracting Officer or his representative by a calibrated light meter that the minimum illumination required by Table 7-1 of the EM 385-1-1 is being provided.(CENAB-EN-DT)

1.10 GOVERNMENT FIELD OFFICE

1.10.1 Resident Engineer's Office

The Contractor shall provide the Government Resident Engineer with an office, approximately 200 square feet in floor area, located where directed, and providing space heat, electric light and power. A mail slot shall be provided in the door, or an apartment-type lockable mail box

mounted on the surface of the door. At completion of the project, the office shall remain the property of the Contractor and shall be removed from the site. All utility connections shall be connected and disconnected in accordance with local codes and to the satisfaction of the Contracting Officer. If a window style air conditioner is used then the refrigerant shall be one of the fluorocarbon gases that is in accordance with FS BB-F-1421 and has an Ozone Depletion Potential (ODP) of less than or equal to 0.05.

1.10.2 Trailer-Type Mobile Office (Contractor's Option)

In lieu of constructing, maintaining and, at end of construction period, removing a temporary type field office, the Contractor may, at his option, furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and providing as a minimum the facilities specified above. The trailer shall be securely anchored to the ground at all four corners to guard against movement during high winds.

1.11 APPEARANCE OF TRAILERS

Trailers utilized by the Contractor for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on the military property.

1.12 MAINTENANCE OF STORAGE AREA

Should the Contractor elect to traverse, with construction equipment or other vehicles, grassed or unpaved areas which are not established roadways, such areas shall be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation shall be at the Contractor's discretion. Grass located within the boundaries of the laydown and / or storage areas construction site shall be mowed for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers shall be edged or trimmed neatly.

1.13 HAUL ROADS (1967)

The Contractor shall, at his expense, construct such access roads and haul roads as may be necessary for proper prosecution of the work under this contract. Haul roads shall be constructed in a workmanlike manner with suitable grades and widths. Sharp curves, blind corners, and dangerous cross traffic shall be avoided. The Contractor shall provide all necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control although optional shall be adequate to insure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval of the Contracting Officer. Upon completion of the work, haul roads as designated by the Contracting Officer shall be removed at the expense of the Contractor. Lighting shall be adequate to assure full and clear visibility for full width of haul and work areas during any night work operations. (CENAB)

1.14 BARRICADES

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required

whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazardous areas during both day and night. Barricade and other physical protection shall be in accordance with EM 385-1-1. "Barricades" as stated herein include temporary fencing (minimum six (6) foot high)to limit access to any active construction areas. "Public" as stated herein refers to any individuals other than Government or Contractor personnel who are directly associated with the Contract, or authorized access by Contracting Officer, Facility, or Contractor. (CENAB)

1.15 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 calendar days after the date established for commencement of work, the Contractor shall furnish and erect temporary project safety fencing at the work site. The safety fencing shall be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 42inches high, supported and tightly secured to steel posts located on maximum 10 foot centers, constructed at the approved location. The safety fencing shall be maintained by the Contractor during the life of the contract and, upon completion and acceptance of the work, shall become the property of the Contractor and shall be removed from the work site.

1.16 SANITATION

The Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer.

1.17 SECURITY PROVISIONS

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall be responsible for the security of its own equipment; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

1.18 CLEANUP

Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

1.19 RESTORATION OF STORAGE AREA

Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced area, if applicable, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including top soil and seeding as necessary.

PART 2 PRODUCT

2.1 BLAZE ORANGE SAFETY FENCE

The high visibility safety fence shall be of high strength, durable, lightweight material meeting the specifications noted on the Contract Drawings and as noted below:

Material:	Blaze Orange Plastic Mesh
Temperature Range:	-22° to 150° F
Aperture Size:	1.3" x 1.3"
U.V. Resistance:	Yes (Fully Stabilized)
Tensile Strength:	850 Lbs./Ft.
Color/Height:	Orange/4 Feet High

PART 3 EXECUTION

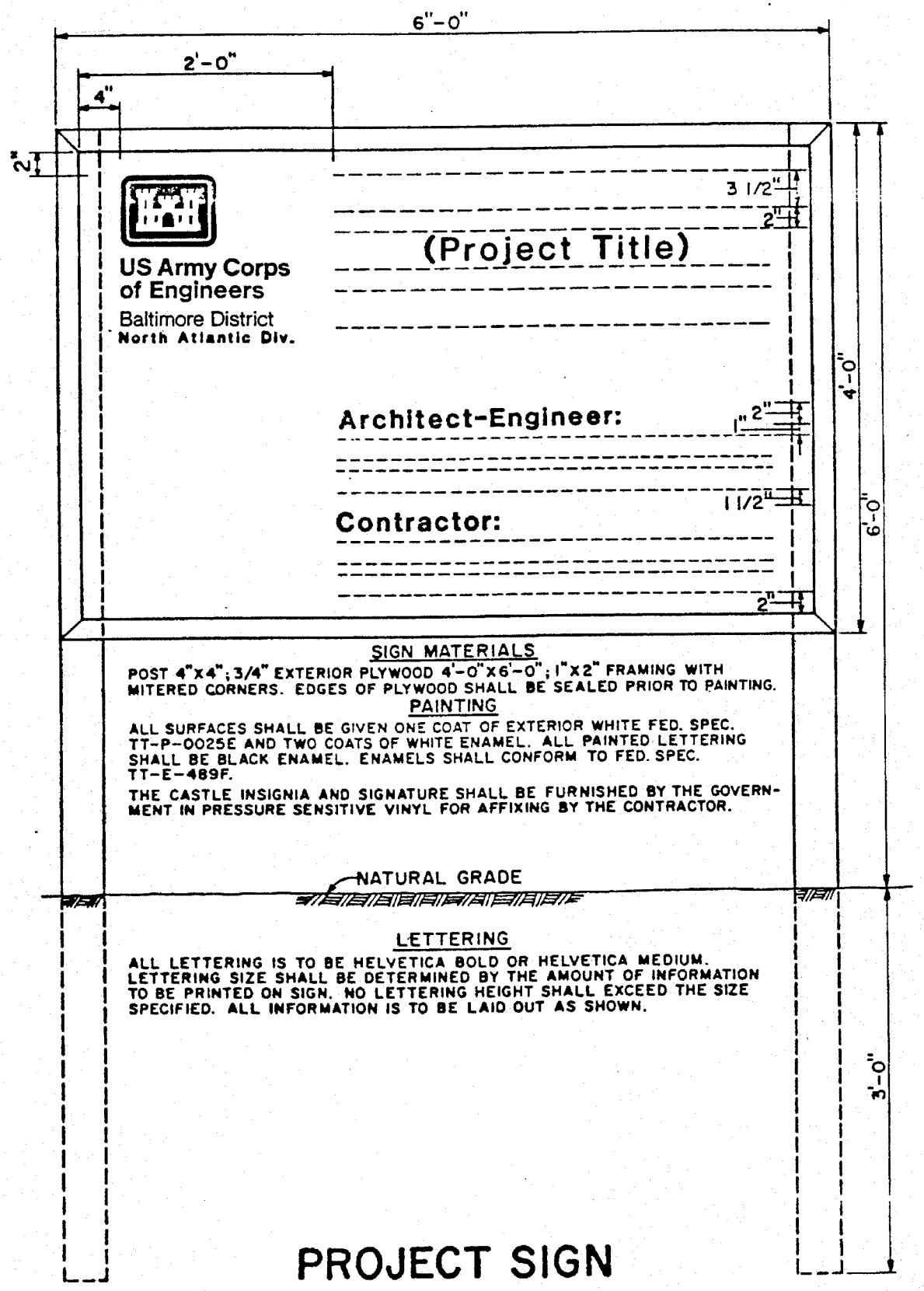
3.1 BLAZE ORANGE SAFETY FENCE

The fence shall be installed around the delineated wetland protection areas prior to starting the work and shall remain in place until all work is complete. The installation, relocation, and removal shall be made at the direction of the Contracting Officer and performed per the manufacturer's specifications.

3.1.1 MEASUREMENT AND PAYMENT

Unless otherwise specified in Section 01270, MEASUREMENT AND PAYMENT, no separate measurement and payment will be made for the work performed in this Section 01510, TEMPORARY CONSTRUCTION ITEMS, specified herein, and all costs in connection therewith shall be considered a subsidiary obligation of the Contractor, and shall be included in the overall cost of the work.

-- End of Section --



SIGN MATERIALS

POST 4"X4"; 3/4" EXTERIOR PLYWOOD 4'-0"X6'-0"; 1"X2" FRAMING WITH MITERED CORNERS. EDGES OF PLYWOOD SHALL BE SEALED PRIOR TO PAINTING.

PAINTING

ALL SURFACES SHALL BE GIVEN ONE COAT OF EXTERIOR WHITE FED. SPEC. TT-P-0025E AND TWO COATS OF WHITE ENAMEL. ALL PAINTED LETTERING SHALL BE BLACK ENAMEL. ENAMELS SHALL CONFORM TO FED. SPEC. TT-E-489F.

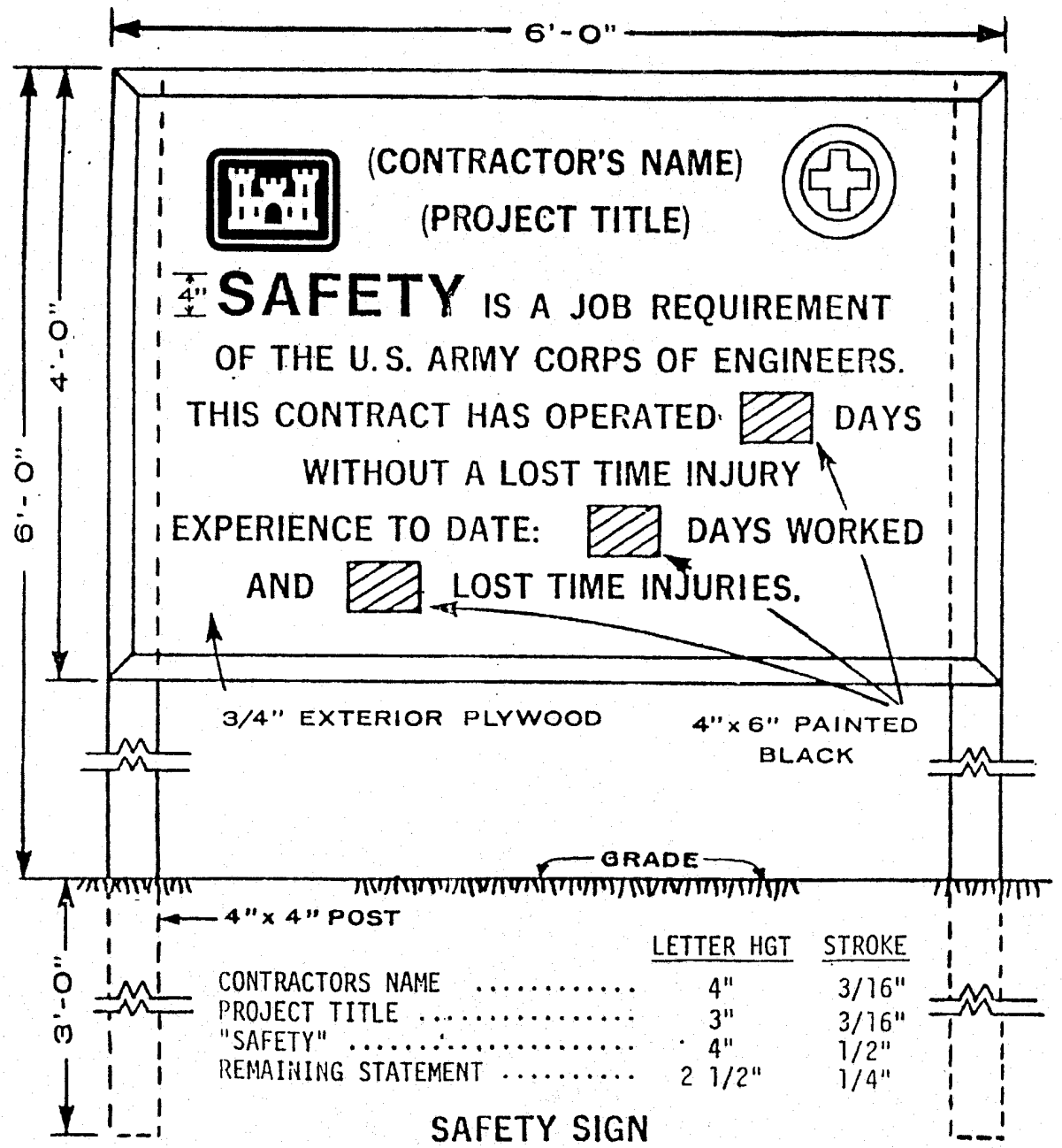
THE CASTLE INSIGNIA AND SIGNATURE SHALL BE FURNISHED BY THE GOVERNMENT IN PRESSURE SENSITIVE VINYL FOR AFFIXING BY THE CONTRACTOR.

LETTERING

ALL LETTERING IS TO BE HELVETICA BOLD OR HELVETICA MEDIUM. LETTERING SIZE SHALL BE DETERMINED BY THE AMOUNT OF INFORMATION TO BE PRINTED ON SIGN. NO LETTERING HEIGHT SHALL EXCEED THE SIZE SPECIFIED. ALL INFORMATION IS TO BE LAID OUT AS SHOWN.

PROJECT SIGN

APR.83



	LETTER HGT	STROKE
CONTRACTORS NAME	4"	3/16"
PROJECT TITLE	3"	3/16"
"SAFETY"	4"	1/2"
REMAINING STATEMENT	2 1/2"	1/4"

SAFETY SIGN

SIGN MATERIALS

POST 4"x4";3/4" EXTERIOR PLY-WOOD 4'-0"x 6'-0", 2"x2" FRAMING WITH MITERED CORNERS. FRAMING ENCLOSED EDGES OF PLYWOOD AND BE INSTALLED FLUSH ON BACK SIDE AND PROJECTING IN FRONT. OUT-SIDE WHITE, HOUSE PAINT-2 COATS; BOTH SIDES AND EDGES; COLORS IN OIL FOR LETTERING - LAMP BLACK AND BULLETIN RED; CASTLE SHALL BE RED; LETTERING SHALL BE BLACK; THE CROSS SHALL BE GREEN

THE CASTLE INSIGNIA SHALL BE FURNISHED BY THE GOVERNMENT IN PRESSURE SENSITIVE VINYL FOR AFFIXING BY THE CONTRACTOR.

ATTACHMENT 2

SECTION 01780

CLOSEOUT SUBMITTALS

Includes Special Change (Submittal Paragraph)(June 2000)

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-18 Records

As-Built Drawings; G, ED.

Drawings showing final as-built conditions of the project. The final CADD as-built drawings shall consist of one set of electronic CADD drawing files in the specified format, one set of mylar drawings, 2 sets of blue-line prints of the mylars, and one set of the approved working as-built drawings.

As-Built Record of Equipment and Materials

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

Warranty Management Plan; G, ED.

One set of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Final Clean-Up

Two copies of the listing of completed final clean-up items.

1.2 PROJECT RECORD DOCUMENTS

1.2.1 As-Built Drawings

This paragraph covers as-built drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing files," "working as-built drawings" and "final as-built drawings" refer to contract drawings which are revised to be used for final as-built drawings.

1.2.1.1 Government Furnished Materials

One set of electronic CADD files in the specified software and format revised to reflect all bid amendments will be provided by the Government at

the preconstruction conference for projects requiring CADD file as-built drawings.

1.2.1.2 Working As-Built and Final As-Built Drawings

The Contractor shall revise 2 sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. These working as-built marked drawings shall be kept current on a weekly basis and at least one set shall be available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. Final as-built drawings shall be prepared after the completion of each definable feature of work as listed in the Contractor Quality Control Plan. The working as-built marked prints and final as-built drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final as-built drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. The working and final as-built drawings shall show, but shall not be limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average depth below the surface of each run shall also be recorded.

b. The location and dimensions of any changes within the building structure.

c. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

d. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes etc.

e. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

f. Changes or modifications which result from the final inspection.

g. Where contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built prints.

h. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, the Contractor shall furnish a contour map of the final borrow pit/spoil area elevations.

i. Modifications (change order price shall include the Contractor's cost to change working and final as-built drawings to reflect modifications) and compliance with the following procedures.

(1) Directions in the modification for posting descriptive changes shall be followed.

(2) A Modification Circle shall be placed at the location of each deletion.

(3) For new details or sections which are added to a drawing, a Modification Circle shall be placed by the detail or section title.

(4) For minor changes, a Modification Circle shall be placed by the area changed on the drawing (each location).

(5) For major changes to a drawing, a Modification Circle shall be placed by the title of the affected plan, section, or detail at each location.

(6) For changes to schedules or drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.

(7) The Modification Circle size shall be 1/2 inch diameter unless the area where the circle is to be placed is crowded. Smaller size circle shall be used for crowded areas.

1.2.1.3 Drawing Preparation

The as-built drawings shall be modified as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract set into agreement with approved working as-built prints, and adding such additional drawings as may be necessary. These working as-built marked prints shall be neat, legible and accurate. These drawings are part of the permanent records of this project and shall be returned to the Contracting Officer after approval by the Government. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at no expense to the Government.

1.2.1.4 Computer Aided Design and Drafting (CADD) Drawings

Only personnel proficient in the preparation of CADD drawings shall be employed to modify the contract drawings or prepare additional new drawings. Additions and corrections to the contract drawings shall be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering conventions, and symbols. If additional drawings are required, they shall be prepared using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final as-built drawings shall be identical to that used on the contract drawings. Additions and corrections to the contract drawings shall be accomplished using CADD files. The electronic files will be supplied on 3-1/2 inch high density floppy disks (for projects with electronic digital files or sets of files less than or equal

to 4 diskettes) . The Contractor shall be responsible for providing all program files and hardware necessary to prepare final as-built drawings. The Contracting Officer will review final as-built drawings for accuracy and the Contractor shall make required corrections, changes, additions, and deletions.

a. CADD colors shall be the "base" colors of red, green, and blue. Color code for changes shall be as follows:

(1) Deletions (red) - Deleted graphic items (lines) shall be colored red with red lettering in notes and leaders.

(2) Additions (Green) - Added items shall be drawn in green with green lettering in notes and leaders.

(3) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes shall be in blue.

b. The Contract Drawing files shall be renamed in a manner related to the contract number (i.e., 98-C-10.DGN) as instructed in the Pre-Construction conference. Marked-up changes shall be made only to those renamed files. All changes shall be made on the layer/level as the original item. There shall be no deletions of existing lines; existing lines shall be over struck in red. Additions shall be in green with line weights the same as the drawing. Special notes shall be in blue on layer #63.

c. When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 3/16 inch high. All other contract drawings shall be marked either "AS-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. Original contract drawings shall be dated in the revision block.

d. Within 10 days for contracts less than $5 million after Government approval of all of the working as-built drawings for a phase of work, the Contractor shall prepare the final CADD as-built drawings for that phase of work and submit two sets of blue-lined prints of these drawings for Government review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within 7 days for contracts less than $5 million the Contractor shall revise the CADD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 10 days for contracts less than $5 million of substantial completion of all phases of work, the Contractor shall submit the final as-built drawing package for the entire project. The submittal shall consist of one set of electronic files on 3-1/2 inch high density floppy disks (for projects with electronic digital files or sets of files less than or equal to 4 diskettes) , one set of mylars, two sets of blue-line prints and one set of the approved working as-built drawings. They shall be complete in all details and identical in form and function to the contract drawing files supplied by the Government. Any transactions or adjustments necessary to accomplish this is the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CADD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final as-built drawing files and marked prints as specified shall be cause for withholding any payment due the Contractor under this contract.

Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

1.2.1.5 Payment

No separate payment will be made for as-built drawings required under this contract, and all costs accrued in connection with such drawings shall be considered a subsidiary obligation of the Contractor.

1.2.2 As-Built Record of Equipment and Materials

The Contractor shall furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Two sets of final record of equipment and materials shall be submitted 10 days after final inspection. The designations shall be keyed to the related area depicted on the contract drawings. The record shall list the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

1.2.3 Final Approved Shop Drawings

The Contractor shall furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.2.4 Construction Contract Specifications

The Contractor shall furnish final as-built construction contract specifications, including modifications thereto, 30 days after transfer of the completed facility.

1.3 WARRANTY MANAGEMENT

1.3.1 Warranty Management Plan

The Contractor shall develop a warranty management plan. At least 30 calendar days before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. The warranty management plan shall include all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase shall be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Approved information shall be assembled in a binder and shall be turned over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. A joint 4 month and 9 month warranty inspection shall be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer

Representative. Information contained in the warranty management plan shall include, but shall not be limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

1.3.2 Performance Bond

The Contractor's Performance Bond shall remain effective throughout the construction period.

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, the Contractor shall respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.3.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor shall furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, shall be continuously available, and shall be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.3.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, the Contractor shall respond to construction warranty service requirements listed below. The Contractor shall submit a report on any warranty item

that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and backcharge the construction warranty payment item established.

a. All other work to be initiated within 3 work days and work continuously to completion or relief.

1.4 FINAL CLEAN-UP

Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed. A list of completed clean-up items shall be submitted on the day of final inspection .

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SECTION 01850

CONTRACT DRAWINGS

PART 1 GENERAL

1.1 CONTRACT DRAWINGS

The Contract Drawings listed below form a part of the contract.

SHEET	TITLE	BALTIMORE DISTRICT FILE NO.	
C-1	COVER SHEET	FILE:53	MAP:761
C-2	EROSION & SEDIMENT CONTROL NOTES	FILE:53	MAP:762
C-3	SIGNS $ EROSION CONTROL DETAILS	FILE:53	MAP:763
C-4	SITE PLAN	FILE:53	MAP:764
C-5	SITE PLAN	FILE:53	MAP:765
C-6	ROAD PLAN, PROFILE & DETAILS	FILE:53	MAP:766
C-7	STONEWORK DETAILS	FILE:53	MAP:767
C-8	TIMBER WALKWAY / PILE DETAILS	FILE:53	MAP:768
C-9	PROFILES	FILE:53	MAP:769

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

SECTION 02220

DEMOLITION

PART 1 GENERAL

1.1 DESCRIPTION

These specifications provide all labor, materials, equipment and services necessary for and reasonably incidental to executing demolition tasks and related items as shown on the Contract Drawings and/or as specified herein. Demolition includes work associated with the removal of pavement, one culvert pipe and a steel bulkhead.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.3 GENERAL REQUIREMENTS

The work includes demolition and removal of resulting rubbish and debris. Rubbish and debris shall be removed from Government property daily, unless otherwise directed, to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Contracting Officer. In the interest of occupational safety and health, the work shall be performed in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Work Plan; G, ED

The procedures proposed for the accomplishment of the work. The procedures shall provide for safe conduct of the work, including procedures and methods to provide necessary supports, lateral bracing and shoring when required and coordination with other work in progress. The procedures shall include a detailed description of the methods and equipment to be used, and the sequence of operations in accordance with EM 385-1-1.

1.5 PROTECTION

1.5.1 Protection of Personnel

During the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site.

1.5.2 Protection of Structures

The Contractor shall ensure that no elements determined to be unstable are left unsupported and shall be responsible for placing and securing bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.5.3 Protection of Existing Property

Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government; any damaged items shall be repaired or replaced as approved by the Contracting Officer. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required.

1.5.4 Environmental Protection

The work plan shall comply with the requirements of Section 01355 ENVIRONMENT PROTECTION.

1.6 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted.

1.7 USE OF EXPLOSIVES

Use of explosives will not be permitted.

PART 2 PRODUCTS

None

PART 3 EXECUTION

3.1 EXISTING STRUCTURES

Existing structures and/or improvements indicated shall be removed and/or repositioned as shown on the drawings.

3.1.1 Pavement Removal

This work shall consist of the full depth removal and disposal of the existing pavement on St. Martins Neck Road, as specified on the Contract Drawings. Disposal of the material shall be to a facility approved by the Contracting Officer.

3.1.2 Corrugated Metal Pipe (CMP) Removal

Contractor shall remove the existing culvert pipe in its entirety and in accordance with the Contract Drawings. Upon removal, the culvert pipe shall become the property of the Contractor.

3.1.2.1 Pipe Excavation

The width of the excavation trench for pipe removal shall be of a sufficient width for the construction of replacement pipe. Contractor to refer to Contract Drawings for size and length of replacement culvert pipe. This width shall not be less than twice the outside diameter of the in-kind replacement pipe or the outside diamter plus 18 inches on each side, whichever is less.

3.1.3 Steel Bulkhead

The Contractor shall remove the existing steel bulkhead where shown on the Contract Drawings, and dispose off-site to a facility approved by the Contracting Officer. It is suspected that the steel sheeting located below grade is coated with coal tar epoxy. The bulkhead shall be removed either in its entirety or cut off twenty-four inches (24") minimum below the proposed geotextile as approved by the Contracting Officer.

3.2 UTILITY LINES

When utility lines are encountered that are not indicated on the drawings, the Contracting Officer shall be notified prior to further work in that area.

3.3 DISPOSITION OF MATERIAL

Title to material to be demolished, except Government salvage and historical items, is vested in the Contractor upon receipt of notice to proceed. The Government will not be responsible for the condition, loss or damage to such property after notice to proceed.

3.3.1 Historical Items

Historical items shall be removed in a manner to prevent damage. Historical items shall be delivered to the Government for disposition.

3.3.2 Unsalvageable Material

Combustible material shall be disposed of off the site .

3.4 CLEAN UP

Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

3.5 MEASUREMENT AND PAYMENT

3.5.1 General

Measurement and payment shall be in accordance with Section 01270 MEASUREMENT AND PAYMENT.

-- End of Section --

SECTION 02300

EARTHWORK

PART 1 GENERAL

1.1 DESCRIPTION

These specifications provide all labor, materials, equipment and services necessary for and reasonably incidental to executing all earthwork landward of the shoreline for preparation of subgrade for structures and pavements, furnishing and installing backfill, excavating, compacting and related Phase 1 items as shown on the Contract Drawings and/or as specified herein.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM D 422	(1963; R 1998) Particle-Size Analysis of Soils
ASTM D 1140	(1997) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
ASTM D 1556	(1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))
ASTM D 2487	(1998) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(1996) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 4318	(1998) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

1.3 DEFINITIONS

1.3.1 Shoreline

Area at the project site located landward of the concrete rubble revetment or the bottom of the bank, whichever is further landward.

1.3.2 Satisfactory Materials

1.3.2.1 General Site Grading Areas

Satisfactory materials shall comprise any materials classified by ASTM D 2487 as GW, GP, GM, SW, SP, and SM. Satisfactory materials for grading shall be comprised of stones less than 8 inches.

1.3.2.2 Pavement Areas

Satisfactory materials shall comprise any materials classified by ASTM D 2487 as GW, GP, GM, SW, SP, SM, ML, GC, MH, CL and CH. Satisfactory materials for grading shall be comprised of stones less than 3 inches in any dimension.

1.3.2.3 Fill and Fill Areas

Fill and fill areas, as defined in this Section only, refer to all areas of lines, grades, and elevations shown for site work associated with the constrution of pavement areas only.

1.3.3 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include man-made fills; trash; refuse; and material classified as satisfactory which contains root and other organic matter or frozen material. The Contracting Officer shall be notified of any contaminated materials.

1.3.4 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic. Testing required for classifying materials shall be in accordance with ASTM D 4318, ASTM C 136, ASTM D 422, and ASTM D 1140.

1.3.5 Degree of Compaction

Degree of compaction required is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated as a percent of laboratory maximum density.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Earthwork; G, ED

Procedure and location for disposal of unused satisfactory material. Proposed source of borrow material.

SD-13 Certificates

Testing; G, ED

Qualifications of the commercial testing laboratory or Contractor's testing facilities. The laboratory must be a USACE validated laboratory. If the Contractor elects to set up an on-site laboratory at the project site, the Contractor may be assessed $6,500 for the cost of inspection of this laboratory by the USACE.

Within 24 hours of conclusion of physical tests, 5 copies of test results, including calibration curves and results of calibration tests.

1.5 CLASSIFICATION OF EXCAVATION

No consideration will be given to the nature of the materials, and all excavation will be designated as unclassified excavation.

1.5.1 Common Excavation

Common excavation shall include the satisfactory removal and disposal of all materials.

1.6 BLASTING

Blasting will not be permitted.

1.7 UTILIZATION OF EXCAVATED MATERIALS

Unsatisfactory materials removed from excavations shall be disposed of off-site at a location obtained by the Contractor and approved by the Contracting Officer at no additional costs. Satisfactory material removed from excavations shall be used, insofar as practicable, in the construction of fills, embankments, subgrades bedding (as backfill), and for similar purposes. No satisfactory excavated material shall be wasted without specific written authorization. Satisfactory material authorized to be wasted shall be disposed of off-site at a location obtained by the Contractor and approved by the Contracting Officer at no additional costs. Newly designated waste areas on Government-controlled land shall be cleared and grubbed before disposal of waste material thereon. No excavated material shall be disposed of to obstruct the flow of any stream, endanger a partly finished structure, impair the efficiency or appearance of any structure, or be detrimental to the completed work in any way.

PART 2 PRODUCTS

2.1 Fill Material

Fill material furnished by the Contractor for the construction of fills, subgrades, bedding (as backfill), and for similar purposes shall be in accordance with the Section SATISFACTORY MATERIALS.

PART 3 EXECUTION

3.1 STRIPPING OF TOPSOIL

Topsoil shall be spread on areas already graded and prepared for topsoil, or transported and deposited in stockpiles convenient to areas that are to receive application of the topsoil later, or at locations indicated or specified. Topsoil shall be kept separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 2 inches in diameter, and other materials that would interfere with planting and maintenance operations. Any surplus of topsoil from excavations and grading shall be removed from the site.

3.2 GENERAL EXCAVATION

The Contractor shall perform excavation of every type of material encountered within the limits of the project to the lines, grades, and elevations indicated and as specified. Grading shall be in conformity with the typical sections shown and the tolerances specified in paragraph FINISHING. Satisfactory excavated materials shall be transported to and placed in fill within the limits of the work. Unsatisfactory materials encountered within the limits of the work shall be excavated below grade and replaced with satisfactory materials as directed. Such excavated material and the satisfactory material ordered as replacement shall be included in excavation. Surplus satisfactory excavated material not required for fill shall be disposed of off-site at a location obtained by the Contractor and approved by the Contracting Officer at no additional costs. Unsatisfactory excavated material shall be disposed of off-site at a location obtained by the Contractor and approved by the Contracting Officer at no additional costs. During construction, excavation and fill shall be performed in a manner and sequence that will provide proper drainage at all times. Material required for fill in excess of that produced by excavation within the grading limits shall be excavated from the borrow areas or from other approved areas selected by the Contractor as specified.

3.2.1 Ditch Changes

Excavation of ditch changes shall be accomplished by cutting accurately to the cross sections, grades, and elevations shown. Ditches shall not be excavated below grades shown. Excessive open ditch excavation shall be backfilled with satisfactory, thoroughly compacted, material or with suitable stone or cobble to grades shown. Material excavated shall be disposed of as shown or as directed, except that in no case shall material be deposited less than 4 feet from the edge of a ditch. The Contractor shall maintain excavations free from detrimental quantities of leaves, brush, sticks, trash, and other debris until final acceptance of the work.

3.2.2 Drainage Structures

Excavations shall be made to the lines, grades, and elevations shown, or as directed.

3.3 SELECTION OF BORROW MATERIAL

Borrow material shall be selected to meet the requirements and conditions of the particular fill for which it is to be used. Borrow material shall be obtained from the borrow areas from approved sources, either private or within the limits of the project site, selected by the Contractor. Unless otherwise provided in the contract, the Contractor shall obtain from the owners the right to procure material, pay royalties and other charges involved, and bear the expense of developing the sources, including rights-of-way for hauling. Borrow material from approved sources on

Government-controlled land may be obtained without payment of royalties. Unless specifically provided, no borrow shall be obtained within the limits of the project site without prior written approval. Necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris thereon shall be considered related operations to the borrow excavation.

3.4 OPENING AND DRAINAGE OF EXCAVATION AND BORROW PITS

The Contractor shall notify the Contracting Officer sufficiently in advance of the opening of any excavation or borrow pit to permit elevations and measurements of the undisturbed ground surface to be taken. Except as otherwise permitted, borrow pits and other excavation areas shall be excavated providing adequate drainage. Borrow pits shall be neatly trimmed and drained after the excavation is completed. The Contractor shall ensure that excavation of any area, operation of borrow pits, or dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.5 GRADING AREAS

Where indicated, work will be divided into grading areas within which satisfactory excavated material shall be placed in embankments, fills, required backfills and pavement areas. The Contractor shall not haul satisfactory material excavated in one grading area to another grading area except when so directed in writing.

3.6 BACKFILL

Backfill adjacent to any and all types of structures shall be placed and compacted to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials to prevent wedging action or eccentric loading upon or against the structure. Ground surface on which backfill is to be placed shall be prepared as specified in paragraph PREPARATION OF GROUND SURFACE FOR FILL AREAS. Compaction requirements for backfill materials shall also conform to the applicable portions of paragraphs PREPARATION OF GROUND SURFACE FOR FILL AREAS and SUBGRADE PREPARATION. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.7 PREPARATION OF GROUND SURFACE FOR FILL AREAS

3.7.1 General Requirements

Ground surface on which fill is to be placed shall be stripped of live, dead, or decayed vegetation, rubbish, debris, and other unsatisfactory material; plowed; disked; pulverized; moistened or aerated as necessary; thoroughly mixed; and compacted to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. The prepared ground surface shall be scarified and moistened or aerated as required just prior to placement of fill material to assure adequate bond between material and the prepared ground surface.

3.7.2 Frozen Material

Fill shall not be placed on a foundation which contains frozen material, or which has been subjected to freeze-thaw action. This prohibition encompasses all foundation types, including the natural ground, all prepared subgrades (whether in an excavation or on an embankment) and all layers of previously placed and compacted earth fill which become the foundations for successive layers of earth fill. All material that freezes or has been subjected to freeze-thaw action during the construction work, or during periods of temporary shutdowns, such as, but not limited to, nights, holidays, weekends, winter shutdowns, or earthwork operations, shall be removed to a depth that is acceptable to the Contracting Officer and replaced with new material. Alternatively, the material will be thawed, dried, reworked, and recompacted to the specified criteria before additional material is placed. The Contracting Officer will determine when placement of fill shall cease due to cold weather. The Contracting Officer may elect to use average daily air temperatures, and/or physical observation of the soils for his determination. Fill shall not contain frozen clumps of soil, snow, or ice.

3.8 SUBGRADE PREPARATION

3.8.1 Construction

Subgrade shall be shaped to line, grade, and cross section, and compacted as specified. This operation shall include plowing, disking, and any moistening or aerating required to obtain specified compaction. Soft or otherwise unsatisfactory material shall be removed and replaced with satisfactory excavated material or other approved material as directed. Low areas resulting from removal of unsatisfactory material or excavation of rock shall be brought up to required grade with satisfactory materials, and the entire subgrade shall be shaped to line, grade, and cross section and compacted as specified. After rolling, the surface of the subgrade for roadways shall not show deviations greater than 1/2 inch when tested with a 10 foot straightedge applied both parallel and at right angles to the centerline of the area. The elevation of the finish subgrade shall not vary more than 0.05 foot from the established grade and cross section.

3.8.2 Compaction

Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment. Except for paved areas, each layer of the fill area shall be compacted to at least 85 percent of laboratory maximum density.

3.8.2.1 Subgrade for Pavements

Subgrade for pavements shall be compacted to at least 95 percentage laboratory maximum density for the depth below the surface of the pavement shown. When more than one soil classification is present in the subgrade, the top 8 inches of subgrade shall be scarified, windrowed, thoroughly blended, reshaped, and compacted.

3.9 FINISHING

The surface of excavations and subgrades shall be finished to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. The degree of finish for graded areas shall be within 0.1 foot of the grades and elevations indicated except that the degree of finish for subgrades shall be specified in paragraph SUBGRADE PREPARATION. Ditches shall be finished in a manner that will result in effective

drainage.

3.10 PLACING TOPSOIL

On areas to receive topsoil, the compacted subgrade soil shall be scarified to a 2 inch depth for bonding of topsoil with subsoil. Topsoil then shall be spread evenly to a thickness of 4 inches and graded to the elevations and slopes shown. Topsoil shall not be spread when frozen or excessively wet or dry. Material required for topsoil in excess of that produced by excavation within the grading limits shall be obtained from offsite areas.

3.11 TESTING

Contractor will engage a professional geotechnical firm for quality control testing and inspection during earthwork operations. Cost of testing and inspection shall be borne by the Contractor. The subgrades and fill layers must be approved by Contractor's testing and inspection firm before further construction work is performed. The testing and inspection firm shall provide its professional opinion, by letter, sealed and signed by a professional engineer registered in the State of Maryland, that the earthwork has been completed in accordance with Contract Drawings and Specification.

3.11.1 Fill and Backfill Material Gradation

One test per 100 cubic yards stockpiled or in-place source material. Gradation of fill and backfill material shall be determined in accordance with ASTM C 136.

3.11.2 Check Tests on In-Place Densities

If ASTM D 2922 is used, in-place densities shall be checked by ASTM D 1556 as follows:

a. One check test per lift for each 1,000 square feet, or fraction thereof, of each lift of fill or backfill compacted by other than hand-operated machines.

b. One check test per lift for each 2,000 square feet, of fill or backfill areas compacted by hand-operated machines.

3.11.3 Moisture Contents

In the stockpile, excavation, or borrow areas, a minimum of two tests per day per type of material or source of material being placed during stable weather conditions shall be performed. During unstable weather, tests shall be made as dictated by local conditions and approved by the Contracting Officer.

3.11.4 Optimum Moisture and Laboratory Maximum Density

Tests shall be made for each type material or source of material including borrow material to determine the optimum moisture and laboratory maximum density values. One representative test per 100 cubic yards of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.

3.11.5 Tolerance Tests for Subgrades

Continuous checks on the degree of finish specified in paragraph SUBGRADE PREPARATION shall be made during construction of the subgrades.

3.12 SUBGRADE AND FILL AREA PROTECTION

During construction, embankments and excavations shall be kept shaped and drained. Ditches and drains along subgrade shall be maintained to drain effectively at all times. The finished subgrade shall not be disturbed by traffic or other operation and shall be protected and maintained by the Contractor in a satisfactory condition until ballast, subbase, base, or pavement is placed. The storage or stockpiling of materials on the finished subgrade will not be permitted. No subbase, base course, ballast, or pavement shall be laid until the subgrade has been checked and approved, and in no case shall subbase, base, surfacing, pavement, or ballast be placed on a muddy, spongy, or frozen subgrade.

3.13 MEASUREMENT AND PAYMENT

3.13.1 General

Measurement and payment shall be in accordance with Section 01270 MEASUREMENT AND PAYMENT.

-- End of Section --

SECTION 02379

GEOTEXTILES

PART 1 GENERAL

1.1 DESCRIPTION

The work covered by this section consists of furnishing all labor, materials, tools, equipment, and incidentals necessary to perform all work required to install geotextile material on the foundation for the breakwater and sill, complete as specified herein and shown on the Contract Drawings. This includes maintaining the geotextile until placement of the overlying stone material is completed and accepted.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 123	(1996a) Standard Terminology Relating to Textiles
ASTM D 4354	(1996) Sampling of Geosynthetics for Testing
ASTM D 4355	(1992) Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
ASTM D 4491	(1999) Water Permeability of Geotextiles By Permittivity
ASTM D 4533	(1991; R 1996) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(1991; R 1996) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(1999) Determining Apparent Opening Size of a Geotextile
ASTM D 4833	(1988; R 1996) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
ASTM D 4873	(1997) Identification, Storage, and Handling of Geosynthetic Rolls
ASTM D 4884	(1996) Strength of Sewn or Thermally Bonded Seams of Geotextiles

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-13 Certificates

Geotextile; G, ED

Submit the manufacturer's certification of the geotextile material.

SD-14 Samples

Geotextile; G, ED

If requested,submit geotextile samples for testing to determine compliance with the requirements in this specification. When required, submit samples a minimum of 30 days prior to the beginning of installation of the same textile. Upon delivery of the geotextile, submit duplicate copies of the written certificate of compliance signed by a legally authorized official of the manufacturer. The certificate shall state that the geotextile shipped to the site meets the chemical requirements and exceeds the minimum average roll value listed in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR GEOTEXTILE. Upon request, supply quality control and quality assurance tests for the geotextile. All samples provided shall be from the same production lot as will be supplied for the contract, and shall be the full manufactured width of the geotextile by at least 10 feet long, except that samples for seam strength may be a full width sample folded over and the edges stitched for a length of at least 5 feet. Samples submitted for testing shall be identified by manufacturers lot designation. For needle punched geotextile, the manufacturer shall certify that the geotextile has been inspected using permanent on-line metal detectors and does not contain any needles.

1.4 SHIPMENT, HANDLING, AND STORAGE

1.4.1 Shipment and Storage

Only approved geotextile rolls shall be delivered to the project site. All geotextile shall be labeled, shipped, stored, and handled in accordance with ASTM D 4873. No hooks, tongs, or other sharp instruments shall be used for handling geotextile.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Geotextile

2.1.1.1 General

The geotextile shall be a woven pervious sheet of plastic yarn as defined by ASTM D 123. The geotextile shall equal or exceed the minimum average

roll values listed in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR GEOTEXTILE. Strength values indicated in the table are for the weaker principal direction.

TABLE 1
MINIMUM PHYSICAL REQUIREMENTS FOR GEOTEXTILE

PROPERTY	UNITS	ACCEPTABLE VALUES	TEST METHOD
GRAB STRENGTH	lb	370	ASTM D 4632
SEAM STRENGTH	lb	250	ASTM D 4632
PUNCTURE	lb	135	ASTM D 4833
TRAPEZOID TEAR	lb	100	ASTM D 4533
LATERAL PERMEABILITY	cm/sec	.01	ASTM D 4491
APPARENT OPENING SIZE	U.S. SIEVE	70-100	ASTM D 4751
PERMITTIVITY	sec -1	.28	ASTM D 4491
ULTRAVIOLET DEGRADATION	Percent	70-90% RETAINED STRENGTH	ASTM D 4355

2.1.1.2 Geotextile Fiber

Fibers used in the manufacturing of the geotextile shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of polyolefins, polyesters, or polamides. Stabilizers and/or inhibitors shall be added to the base polymer if necessary to make the filaments resistant to deterioration caused by ultraviolet light and heat exposure. Reclaimed or recycled fibers or polymer shall not be added to the formulation. Geotextile shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including the edges. The edges of the geotextile shall be finished to prevent the outer fiber from pulling away from the geotextile.

2.1.2 Seams

The seams of the geotextile shall be sewn with thread of a material meeting the chemical requirements given above for geotextile yarn or shall be bonded by cementing or by heat. The sheets of geotextile shall be attached at the factory or another approved location, if necessary, to form sections not less than the width of the structure. Seams shall be tested in accordance with method ASTM D 4884. The strength of the seam shall be not less than 90 percent of the required grab tensile strength of the unaged geotextile in any principal direction.

2.1.3 Securing Pins

The geotextile shall be secured to the foundation soil by pins to prevent movement prior to placement of breakwater and sill materials. Other appropriate means to prevent movement such as staples, sand bags, and stone could also be used. Securing pins shall be inserted through both strips of overlapped geotextile along the line passing through midpoints of the

overlap. Securing pins shall be removed as placement of breakwater or sill materials are placed to prevent tearing of geotextile or enlarging holes. Maximum spacing between securing pins depends on the steepness of the embankment slope. The maximum pins spacing shall be equal to or less than the values listed in TABLE 2, MAXIMUM SPACING FOR SECURING PINS. When windy conditions prevail at the construction site, the number of pins should be increased upon the demand of the Contracting Officer.

TABLE 2
MAXIMUM SPACING FOR SECURING PINS

EMBANKMENT	SPACING, feet
STEEPER THAN 1V ON 3H	2
1V ON 3H TO 1V ON 4H	3
FLATTER THAN 1V ON 4H	5

2.2 INSPECTIONS, VERIFICATIONS, AND TESTING

2.2.1 Manufacturing and Sampling

Geotextiles and factory seams shall meet the requirements specified in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR GEOTEXTILE. Conformance testing shall be performed in accordance with the manufacturers approved quality control manual. Geotextiles shall be randomly sampled in accordance with ASTM D 4354 (Procedure Method A). Factory seams shall be sampled at the frequency specified in ASTM D 4884.

2.2.2 Site Verification and Testing

Samples shall be collected at approved locations upon delivery to the site at the request of the Contracting Officer. Samples shall be tested to verify that the geotextile meets the requirements specified in TABLE 1, MINIMUM PHYSICAL REQUIREMENTS FOR GEOTEXTILE. Samples shall be identified by manufacturers name, type of geotextile, lot number, roll number, and machine direction. Testing shall be performed at an approved laboratory. Test results from the lot under review shall be submitted and approved prior to deployment of that lot of geotextile. Rolls which are sampled shall be immediately rewrapped in their protective covering.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Surface on which the geotextile will be placed shall be prepared to a relatively smooth surface condition, in accordance with the applicable portion of this specification and shall be free from obstruction, debris, depressions, erosion feature, or vegetation. Any irregularities will be removed so as to insure continuous, intimate contact of the geotextile with all the surface. Any loose material, soft or low density pockets of material, will be removed; erosion features such as rills, gullies etc. must be graded out of the surface before geotextile placement.

3.2 INSTALLATION OF THE GEOTEXTILE

3.2.1 General

The geotextile shall be placed in the manner and at the locations shown. At the time of installation, the geotextile shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage.

3.2.2 Placement

The geotextile shall be placed with the long dimension parallel to the major axis of the structures and laid smooth and free of tension, stress, folds, wrinkles, or creases. No field overlaps will be permitted parallel to the major axis of each breakwater and sill structure. The strips shall be placed to provide a minimum width of five(5) feet of overlap for each joint perpendicular to the major axis (if required). The Contractor shall adjust the actual length of the geotextile used based on initial installation experience. Temporary pinning of the geotextile to help hold it in place until the bedding layer and the armor stone are placed shall be allowed. The temporary pins shall be removed as the bedding and armor stone are placed to relieve high tensile stress which may occur during placement of material on the geotextile. Trimming shall be performed in such a manner that the geotextile shall not be damaged in any way.

3.3 PROTECTION

The geotextile shall be protected at all times during construction from contamination by surface runoff and any geotextile so contaminated shall be removed and replaced with uncontaminated geotextile. Any damage to the geotextile during its installation or during placement of bedding and armor stone materials shall be replaced by the Contractor at no cost to the Government. The work shall be scheduled so that the covering of the geotextile with a layer of the specified material is accomplished within 2 calendar days after placement of the geotextile. Failure to comply shall require replacement of geotextile. The geotextile shall be protected from damage prior to and during the placement of riprap or other materials. This may be accomplished by limiting the height of drop to less than 1 foot. Before placement of riprap or other materials, the Contractor shall demonstrate that the placement technique will not cause damage to the geotextile. In no case shall any type of equipment be allowed on the unprotected geotextile.

3.4 OVERLAPPING AND SEAMING

3.4.1 Overlapping

The overlap of geotextile rolls for each joint perpendicular to the major axis (if required) shall be a minimum width of five (5) feet. Appropriate measures will be taken to insure required overlap exists after placement of bedding and armor stone.

3.4.2 Sewn Seams

For longitudinal major axis of the structures, geotextile panels shall be factory sewn. High strength thread should be used such that seam test should conform to ASTM D 4884. The thread shall meet the chemical, ultraviolet, and physical requirements of the geotextile, and the color shall be different from that of the geotextile. The seam strength shall be equal to the strength required for the geotextile in the direction across

the seam. Overlapping J-type seams are preferable over prayer-type seams as the overlapping geotextile reduces the chance of openings to occur at the seam. Double sewing shall be used specially for field seams to provide a safety factor against undetected missed stitches.

3.5 MEASUREMENT AND PAYMENT

3.5.1 General

Measurement and payment shall be in accordance with Section 01270, MEASUREMENT AND PAYMENT.

-- End of Section --

SECTION 02457

ROUND TIMBER PILES

PART 1 GENERAL

1.1 DESCRIPTION

The work covered by this section consists of furnishing all labor, materials, equipment and incidentals to install the timber piles for the timber observation walkway and breakwater warning signs in accordance with the specifications and applicable drawings.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 25	(1991) Round Timber Piles

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

AWPA A2	(1998) Methods for Analysis of Waterborne Preservatives and Fire Retardant Formulations
AWPA C1	(1997) All Timber Products - Preservative Treatment by Pressure Processes
AWPA C3	(1997) Piles - Preservative Treatment by Pressure Processes
AWPA C18	(1999) Pressure Treated Material in Marine Construction
AWPA M4	(1996) Standard for the Care of Preservative-Treated Wood Products
AWPA P5	(1983) Standard for Waterborne Preservatives

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Pile Driving Equipment; G

Descriptions of all pile driving equipment to be employed in the work, prior to commencement of pile installations. This shall include details of the pile hammer, power plant, leads, cushion material, and helmet.

SD-04 Drawings

Installation; G, ED

Drawings, including shop and erection details, collars, and shoes as required, prior to commencing the work or ordering materials.

Pile Driving; G, ED

A complete and accurate record of each driven pile within 3 days of completion of driving. The record shall indicate the pile location (as driven), diameter, driven length, embedded length, final elevations of tip and top, collars, shoes, blows required for each foot of penetration throughout the entire length of the pile and for the final 6 inches of penetration, and the total driving time. The record shall also include the type and size of the hammer used, the rate of operation, and the type and dimensions of driving helmet and pile cushion used. Any unusual conditions encountered during pile installation shall be recorded and immediately reported to the Contracting Officer.

SD-09 Reports

Pile Driving Records; G, ED

A complete report of the pile driving records within 7 days of completion of pile installaton, including but not limited to, a description of the pile driving equipment and driving records for piles. The report shall be prepared by or under the direct supervision of a registered professional engineer experienced in pile installaton, provided and paid for by the Contractor.

SD-13 Certificates

Grading and Marking; G

Notarized Manufacturer's Certificates attesting that piles meet the specified requirements for species, grade, and treatment per referenced standards. Certificate of Inspection for grade marked material by an American Lumber Standards Committee (ALSC) reconized inspection agency prior to shipment.

Field Tests and Inspections; G, ED

1.4 DELIVERY AND STORAGE

Piles shall be delivered to the site in an undamaged condition and arranged so that they are not subjected to unequal forces which will tend to twist or warp them. Suitable covering may be required to protect the piles from the weather.

1.5 EXPERIENCE

The work shall be performed by a firm specializing in the specified foundation system and having experience installing the specified foundation system under similar subsurface conditions.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Pressure Treated Piles

Pressure treated piles shall be Southern Yellow Pine, clean-peeled, conforming to ASTM D 25. Piles shall be in one piece. Splices will not be permitted. All piles shall be pressure treated in accordance with AWPA C1, AWPA C3 and AWPA C18 with waterborne preservatives listed in AWPA P5 to a net retention level by assay of 2.5 lb. of chromated copper arsenate Type C per cubic foot of wood as determined by chemical assay according to AWPA A2.

2.1.2 Field Treatment

Pile tops and exposed areas of treated pile that are cut or drilled after treatment shall receive a field treatment in accordance with AWPA M4, Section 1.5.

2.2 INSPECTION FOR PRESERVATIVE TREATMENT

The Contractor shall notify the Contracting Officer not less than 2 weeks prior to the start of preservative treatment, stating the place where treatment will be done. Arrangements for access and facilities in this regard shall be made by the Contractor. In lieu of the inspection specified above, the Contracting Officer may elect to accept manufacturer's certificates stating that marine piling conforms to the requirements of AWPA A2, AWPA C1 and AWPA C3.

2.3 WEATHER GUARDS FOR TIMBER PILES

All exposed vertical pile tops shall be covered with black plastic pile caps. They shall be molded from 3/16 inch thick, ultra-violet resistant, low density polyethylene as approved by the Contracting Officer.

PART 3 EXECUTION

3.1 GRADING AND MARKING

Contractor is to provide grading and marking certificates to Contracting Officer prior to shipment of pilings.

3.2 INSTALLATION

3.2.1 Handling

Piles shall be inspected in the leads, and where the protective shell or treated wood is impaired, between cutoff and a point which will be not less than 10 feet below the ground; the piles shall be repaired in accordance with AWPA M4, unless the pile is damaged to such extent that it is rejected. Pile shall be laterally supported during driving, but shall not be unduly restrained from rotation in the leads. Where pile orientation is essential, the orientation shall be maintained during driving. When

necessary, collars shall be placed around the pile head to prevent brooming. Cant hooks shall not be used in handling treated piles. Cutting of piles shall be with pneumatic tools, sawing, or other means approved by the Contracting Officer. Holes for bolts shall be sized to ensure a driving fit. Where indicated, holes shall be counterbored for the bolt heads and washers. Piles shall be marked in foot increments with lengths numbered in five foot increments, starting at the toe. The final five feet of the pile at the head shall be marked in inches.

3.2.2 Pile Driving

All piles as shown on the drawings shall be driven by gravity, vibratory or diesel hammer. Diesel powered hammers shall be operated at the rate recommended by the manufacturer throughout the entire driving period. Sufficient pressure shall be maintained at the hammer so that for double-acting hammer, the number of blows per minute during and at the completion of driving of a pile is equal approximately to that at which the hammer is rated; for single-acting hammer, there is a full upward stroke of the ram; for differential-type hammer, there is a slight rise of the hammer base during each upward stroke. The pile cushion or capblock shall be replaced whenever it becomes damaged, split, highly compressed, charred or burned, or has become spongy or deteriorated in any manner. The use of small wood blocks, wood chips, rope, or other material permitting excessive loss of hammer energy will not be permitted. The Contracting Officer shall be notified, and will determine what procedure shall be followed, if a pile reaches the specified pile tip elevation without reaching the required driving resistance; or if the required driving resistance is reached before the specified pile tip elevation. In any event, the penetration of the piles shall be such as to give a safe bearing value of 10 tons.

3.2.3 Tolerances in Driving

Piles shall be driven with a variation of not more than 1/4 inch per foot of pile length from the vertical for plumb piles. Butts shall be within 3 inches of the location indicated. Manipulation of piles to force them into position will not be permitted. All piles shall be checked by the Contractor for heave. Piles found to have heaved shall be redriven to the required tip elevation. Piles damaged, mislocated, or driven out of alignment shall be replaced or additional piles driven as directed at the Contractor's expense. Due diligence shall be exercised by the contractor to align successive bents along the length of the walkway.

3.2.4 Jetting

Jetting of piles may be used when permitted by the Contracting Officer . Jetting shall be discontinued when the pile tip is approximately 5 feet above the specified pile tip elevation and the final 5 feet of penetration shall be made by driving. Before commencing with the driving of the final 5 feet, the pile shall be firmly seated in place by the application of a number of reduced energy hammer blows.

3.2.5 Splices

Splicing of piles will not be permitted.

3.2.6 Surface Treatment

After piles have been driven and cut off, all cut, bored, and dapped surfaces shall be treated as specified in AWPA M4, Section 1.5 Field

Treatment.

3.2.7 Pile Caps

In order to ensure minimal trimming of pile tops for proper fit, the Contractor shall measure each pile butt after cut-off and prior to ordering respective pile caps. The method of measuring pile tops shall consist of taking the average of the minimum and maximum diameter per pile and ordering the individual caps to the least half or whole inch increment. Pile tops shall be evenly beveled as necessary to fit the caps and the end grains treated with Bitumastic 300-M. Drill 5/32 inch pilot holes not more than 2 inches o/c around the circumference of the cap skirt. The cap will then be fastened in place with 10 gauge, 1-1/4 inch copper roofing nails.

3.3 PILE DRIVING EQUIPMENT

3.3.1 Diesel Pile Hammers

The diesel pile hammer furnished shall have a capacity at least equal to the hammer manufacturer's recommendation for the total weight of pile and character of subsurface material to be encountered. For piles of any length, the maximum driving energy of the hammer shall be 20,000 foot-pounds.

3.3.2 Vibratory Hammers

The vibratory hammer shall create a force or impulse which when delivered to the pile energizes the pile and drives it to the desired elevation by sustained elastic vibrations. The exciting frequency shall not be less than 60 cycles per second, except during startup or run-down of the equipment. If necessary, brakes or other devises shall be provided to control the run-down period to the satisfaction of the Contracting Officer.

3.3.3 Driving Helmets and Pile Cushions

A driving helmet or cap, including a pile cushion or cap block, shall be used between the top of the pile and the ram to prevent impact damage to the pile. The driving helmet, or cap and pile cushion combination, shall be capable of protecting the head of the pile, minimizing energy absorption, and transmitting hammer energy uniformly and consistently during the entire driving period. The driving helmet or cap shall fit snugly on the top of the pile so that the energy transmitted to the pile is uniformly distributed over the entire surface of the pile head. The pile cushion may be a solid or laminated softwood block with the grain parallel to the pile axis and enclosed in a close-fitting steel housing. The thickness of block shall be suitable for the length of pile to be driven and the character of subsurface material to be encountered. Generally, thicker blocks are required for longer piles and softer subsurface material.

3.3.4 Capblocks

The capblock used between the driving cap and the hammer ram may be of solid hardwood block with grain parallel to the pile axis and enclosed in a close fitting steel housing or may consist of aluminum and approved industrial type plastic laminate discs stacked alternately in a steel housing. Steel plates shall be used at the top and the bottom of the capblock. Where the block is other than that specified above, the Contractor shall submit to the Contracting Officer, at least 2 weeks before the start of test pile driving operations, detailed drawings of the

proposed capblock accompanied by records of its successful use. If a wood capblock is used, it shall not be replaced during the final driving of any pile. The use of small wood blocks, wood chips, rope, or other material permitting excessive loss of hammer energy will not be permitted.

3.4 PILE DRIVING RECORDS

Piles shall be of the class, and shall be driven in a manner specified in all piling elsewhere in this section. A record shall be kept for each pile, of the number of blows required for each 1 foot of penetration throughout the entire length of the pile, the penetration per blow at such intervals as directed and the number of blows for the final 6 inches of penetration. The record shall include the type and size of the hammer used, the rate of operation, and the type and dimensions of driving helmet and pile cushion used. Any unusual occurrence during driving of pile and any increase and decrease of driving resistance shall be recorded by the Contractor and brought to the attention of the Contracting Officer.

3.5 FIELD TREATMENT

Field treat cuts, bevels, notches, and abrasions made in the field in treated piles in accordance with AWPA M4. Trim cuts and abrasions before field treatment. Paint depressions or openings around bolt holes, joints, or gaps including recesses formed by counterboring with preservative treatment used for piles.

3.6 FIELD TESTS AND INSPECTIONS

3.6.1 Test Piles

Test piles shall be of the class, and shall be driven in the manner specified for all piling, except for utilizing vibratory hammers, elsewhere in this section. A record shall be kept for each test pile, of the number of blows required for each 1 foot of penetration throughout the entire length of the pile, the penetration per blow at such intervals as directed and the number of blows for the final 6 inches of penetration. The record shall include the type and size of the hammer used, the rate of operation, and the type and dimensions of driving helmet and pile cushion used. Any unusual occurrence during driving of pile and any increase and decrease of driving resistance shall be recorded by the Contractor and brought to the attention of the Contracting Officer. The Government will use load test and test pile data to determine the "calculated" pile tip elevation and the necessary driving resistance. Test piles shall be driven in the locations indicated or directed by the Contracting Officer, with surrounding earth at the elevations shown. Test piles properly treated and driven without damage to the protective treated shell, and which are located properly, and have adequate driving resistance may be used in the finished work. Jetting will be permitted by the Contracting Officer only when test pile driving clearly establishes the validity of its use.

3.7 MEASUREMENT AND PAYMENT

3.7.1 General

Measurement and payment shall be in accordance with Section 01270, MEASUREMENT AND PAYMENT.

-- End of Section --

SECTION 02486

STONEWORK

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

The work covered by this section consists of furnishing all plant, labor, equipment, and materials and performing all operations in connection with the construction of breakwaters and sill as shown on the Contract Drawings or as directed by the Contracting Officer in accordance with these Specifications and applicable Drawings.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C-88	Soundness of Aggregates by Use of Magnesium Sulfate
ASTM C-97	Absorption and Bulk Specific Gravity of Dimension Stone
ASTM C-127	Specific Gravity and Absorption of Coarse Aggregate
ASTM C-295	Petrographic Examination of Aggregates for Concrete
ASTM C-535	Resistance to Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

CORPS OF ENGINEERS (COE)

CRD C 144	Method of Testing Stone for Resistance to Freezing and Thawing
CRD C 169	Method of Testing Stone for Resistance to Wetting and Drying

ENGINEERING MANUALS (EM)

EM 1110-2-1906	Laboratory Soils Testing

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be

submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Stone Source; G, ED

Within fifteen (15) calendar days after Notice To Proceed (NTP) and for each individual stone source (quarry) identified as a potential stone material supplier for use on this project, the Contractor, shall submit in report format, service history of stone's use as armor stone, test results, and other ancillary data as specified in PART 2 paragraphs 2.2 "SOURCES OF STONE," and 2.3 "TESTING AND APPROVAL FOR STONE QUALITY." The Stone Source Submittal shall be prepared by a state licensed Professional Geologist. Both draft and final copies of each Stone Source Submittal shall be stamped with official seal by the state licensed Professional Geologist preparing these submittals. Sources used in combination should be identified with anticipated percentages within each submittal. The Stone Source submittal shall also include information on the stone source, including but not limited to each lithology proposed as source material to be used in armor, chinking, and bedding/core stone production, geologic structure of local formation, local rock out cropping pattern and structure including joint and fracturing sets, quarry location, total quarry reserve estimates, areas of the quarry producing stone for this project, ledges, specific strata, quarrying procedures/practices, QA/QC practices, total daily production rates for each class of stone material produced, description of armor stone, chinking stone, and bedding/core stone production and shipping methods which shall include all resources and equipment used in this process, estimated production cost per ton to produce the armor, chinking, and bedding/core stone products, and other data including prior laboratory testing records from each source. The written submittal shall likewise include both a general and site specific map for each source. The general map will show the local region of the quarry including major access and shipping routes. The site specific map should fully define the area of operations within the quarry including the boundaries and working benches of the quarry and should be of high resolution. The written submittal shall discuss and identify at least two separate sites where the Contracting Officer, or his designated representative, may observe that stone of the sizes required herein have performed satisfactorily for each source. The Governments approval of a stone source is not to be construed as approval of all stone material from that source. The right is reserved to reject stone material from certain localized areas, zones, strata, or channels from any area in the stone source, when such stone material are unsuitable as determined by the Contracting Officer.

Stone Material Control; G, ED

The Contractor shall submit in written format the means and methods to be used for effective inspection of material quality control (QC) and gradation testing of stone materials in a manner which will result in a satisfactory quality of in-place stone construction. Written procedures shall be included for guiding and instructing the Contractor's SMC inspectors in the techniques and criteria to be used for examining each individual armor and

chinking stone units for quality and acceptability. The SMC inspectors should also be instructed on the techniques and criteria to used for testing for the proper production gradations. Methods of cleaning the Armor Stone surface of dirt and dust for visual inspection shall also be described. This submittal shall be presented to the Contracting Officer at least thirty (30) calendar days in advance of the date stone materials are to be shipped from the stone source site. The Stone Material Control submittal shall designate a Stone Material Control Supervisor who shall be responsible for implementation of all functions of the Stone Material Control program. The Stone Material Control submittal shall also include a blank weekly SMC QC inspection schedule which will be used during stone material production. The Stone Material Control Supervisor shall not have collateral project duties or responsibilities assigned by the Contractor except those specified in the Stone Material Control submittal during the duration of this project. If the prime contractor acquires stone products required for this project through subcontracts, the Stone Material Supervisor shall not be an employee of the subcontracted company or subcontracted corporation producing these stone materials or products. The Stone Material Control Inspectors, however, may be employed by the subcontracted entities directly involved in production of armor, chinking and bedding/core stone material. Government approval of the submittal shall not be provided until after the Contractor has produced satisfactory demonstration stockpiles, but not later than five (5) calendar days after all requirements for the demonstration stockpile are met, including the Contractor's laboratory testing results and prior Stone Source submittals.

Placement Methods; G, ED

The Contractor shall submit his proposed method of construction, to include the sequence of stone placement, methods of placement, and equipment to be used during each construction phase, to the Contracting Officer for approval at least 30 calendar days prior to the scheduled start of work, in accordance with paragraph 3.2, "PLACEMENT."

Stone Testing; G

Prior to shipment of any stone material to the construction site, the Contractor shall submit test results for each distinct lithology (different type material) produced from each source. Testing shall be performed by an independent and Government approved laboratory. The testing procedures are specified in paragraph 2.3 "TESTING AND APPROVAL FOR STONE QUALITY."

Stone Quality Control Testing; G

The Contractor shall submit QC test results for stone material produced from each quarry for each distinct lithologic stone material identified within that quarry proposed for use in production of armor, chinking or bedding/core stone productions for this project structure. QC testing shall be performed by an independent and Government approved laboratory. The QC procedures are specified in PART 2 of this section; paragraph 2.1.6 "Evaluation Testing."

SD-09 Reports

Quality Control; G

The Contractor shall establish and maintain quality control (QC) to assure compliance with contract requirements and shall maintain records of his quality control for all stone material inspections, gradation tests, and construction operations required under this section. A copy of these records, as well as records of corrective action taken, shall be furnished to the Government as required in the paragraph 3.6 "Quality Control," of this section and Section 01451 CONTRACTOR QUALITY CONTROL.

Stone Material Control (SMC) Reports; G

During all Stone Materials Control (SMC) activities, the Contractor shall submit daily reports of all work performed under the approved SMC plan. The reports shall be delivered to the Contracting Officer or his designated representative, not later than the day following the next weekly cycle. Each daily report for each inspector shall include, but not limited to, the following information:

a. SMC Inspector's name

b. Identification of the stone handling equipment and name of equipment operator used to accommodate the stone inspection if it appeared that the equipment or operator was a factor in producing unacceptable stone.

c. Date of stone inspection.

d. Weather conditions.

e. Date stone was removed from quarry face, and date and details of blasting.

f. Location and strata within quarry where stone production took place (horizontally and vertically - use quarry map submitted in the Stone Source Submittal).

g. Cleaning methods required to remove dirt and/or dust from stone material.

h. Color(s) and character(s) used by inspector for spray paint marks and the applicable code for stones which are individually picked and for any rejected stone.

i. Breakdown of the approximate quantity, per gradation range, of accepted and rejected stone processed for the project during the day, and the disposition of the rejected stone materials.

j. A one sentence summary of the cause or causes for most of the rejection of stone occurring during the day.

k. Running totals of the quantity of armor, chinking and bedding/core stone shipped from the source to date.

l. Running average for the approximate per stone weight per

gradation range for stones which are individually picked for the project.

m. Any noticeable change in bulk specific gravity of the stone being produced.

SD-13 Certificates

Weigh Scale Certification; G

If an on-site weight scale is used, prior to the use thereof, the Contractor shall be required to submit pertinent details on the location, type, and construction of the scale, including a copy of the certification of the scale's accuracy from the local weights and measures regulation agency.

SD-14 Samples

Stone Samples; G

For each stone source identified in a Stone Source submittal as a potential stone material supplier to be evaluated, the Contractor shall submit three duplicate test size samples of armor and chinking stone material from each distinctive stratum, bed, or change of material type (lithology) in the quarry. The Contractor shall also be required to crush into the specified testing gradation or cut into the testing size slab each unit of armor and chinking stone selected during selection during this evaluation. A sufficient number of samples shall be furnished to adequately represent the whole quarry or that part of the quarry from which the material will be obtained, as specified in paragraph 2.3 "TESTING AND APPROVAL FOR STONE QUALITY."

1.4 QUALIFICATIONS

Stone Material Control (SMC) Supervisor

The Stone Material Control (SMC) supervisor shall be provided by the Contractor at his expense and shall be a trained State Licensed Geologist with not less than five (5) years experience in assessing stone quality. The SMC supervisor shall be responsible for preparing a weekly SMC inspection schedule and for the proper execution of the SMC plan and shall oversee the work of all SMC inspectors.

1.5 PRE-PRODUCTION QUALITY CONTROL

1.5.1 Material Quality Control

Before selecting a stone source(s) for preparation of a pre-production stockpile, the Contractor shall have the Government's prior approval of all submittals and test results as required herein. All stone material shall pass testing criteria presented in Part 2, paragraph 2.1.6 "Evaluation Testing," of this Section. The material shall also meet the quality standards presented in paragraph 2.1 "STONE" also in Part 2 of this Section.

1.6 DEMONSTRATION STOCKPILE

Following submittal of the Contractor's Stone Material Source submittal,

Testing Results, and Stone Material Control (SMC) plan but prior to the Government's approval of a source's SMC, the Contractor shall make arrangements to provide a pre-production demonstration stockpile for each of the stone sizes or ranges for the project. For each range, the stockpiles shall be segregated by each type of lithology approved by the Government and shall be located at the source of the stone and be shaped in windrow fashion. The stones placed in the demonstration stockpile shall be representative of the overall quality of each lithology type material produced in the source and shall not consist of the most perfect specimens unless it is reasonable to determine that the source will produce the required amount of stone of the applicable size range with a degree of quality no less than that existent in the demonstration stockpile. The quantity of stone in each demonstration stockpile shall be dependent upon the gradation size range and the total quantity of such size range to be produced for the project. The following parameters shall apply:

Size of Individual Stones Within a Range	Demonstration Stockpile Quantity Based on Total Placement Quantity for Size Range *	
	0 to 10k T	10k to 100k T
1 lb to 300 lb	3 Tons	5 Tons
300 lb to 900 lb	20 Tons	30 Tons

* k = 1000, T = Tons

The stones placed in the stockpile shall have been pre-selected by the Contractor's SMC inspector or supervisor and acceptable stones over 500 pounds in size shall have been noticeably marked with a durable, water proof, spray paint with a coded mark to denote acceptability for a certain size range. The Contractor will provide the necessary equipment for weighing and measuring each stone unit. The Contracting Officer shall be present during all weighing activities of stone in demonstration stockpiles. The weight of each armor stone stone and chinking stone units placed in the demonstration shall also be marked by water proof, spray paint. A stockpile of representative reject stones marked with a red "X" shall also be maintained at the site as examples of unacceptable materials or shapes. Weighed stone placed in the demonstrative stockpile will be used by the SMC supervisor or inspector(s) as a means of comparison and estimating information required in daily Stone Material Control (SMC) reports.

1.6.1 Evaluation of Demonstration Stockpile

The Contractor shall notify the Contracting Officer, or his designated representative (COR), when stockpiles are ready for evaluation. The Contractor's approved SMC supervisor and all SMC inspectors shall accompany the COR during the Government's evaluation of the demonstration stockpiles. The Contractor shall be responsible to have individual stones turned as necessary to accommodate the COR's evaluation. The COR shall mark rejected stones with a red X and such stones shall be removed to the reject stockpile or to a crusher if one is available. If more than 10 rejected stones are found within a stockpile, the entire stockpile shall be rejected by the Government and a replacement stockpile created for re-evaluation. If the replacement stockpile is rejected, the Contractor shall revise and resubmit its SMC plan within seven calendar (7) days and shall create another replacement demonstration stockpile for evaluation. If the third demonstration stockpile for a particular size range at a single source is

rejected, the entire source will be rejected for such size range and the second source be identified in a Stone Source submittal. In addition the Contractor shall submit the name and qualification for a person to replace the SMC supervisor. The replacement of demonstration stockpiles, supervisors, inspectors, or stone material shall be at no additional cost to the Government and with no change in the time of completion.

1.6.2 Approval of Demonstration Stockpiles

At the time the Contracting Officer or his designated representative finds the contents of a demonstration stockpile to be acceptable, through visual examination, the Contractor will be notified in writing within seven (7) calendar days of evaluation of the demonstration stockpile that the source, the SMC plan, and SMC staff are approved, whereupon the Contractor may proceed with production of material for the project provided they are consistent with the demonstration stockpile.

1.6.3 Duration of Demonstration Stockpiles

Other than for being shipped as the final quantities of materials to be placed in the project structure, each demonstration stockpile shall remain unchanged at each source area for each stone range until all other material of that size range represented by the stockpile has been shipped from that source. The demonstration stockpile integrity shall be insured by surrounding the stockpile by yellow caution tape secured on wooden or metal posts driven into the ground.

1.7 QUALITY CONTROL STAFFING

The SMC supervisor shall be on the site of the stone source at all times that stone production, handling, hauling are taking place, unless otherwise approved by the COR. The SMC supervisor shall train the SMC inspectors in the proper performance of their duties, offer advice and assistance to the inspectors, and may, if necessary, perform duties also applicable to SMC inspectors. A weekly schedule of SMC inspection schedule shall be prepared and submitted to the Contracting Officer by the SMC supervisor one week prior to the date of the scheduled QC inspections. The weekly SMC QC inspection schedule shall designate a daily SMC inspector and a telephone number where that inspector can be reached. The SMC supervisor shall maintain a qualified and adequate inspection staff and shall replace any persons not performing satisfactorily. The SMC supervisor shall be responsible for the quality of all stone construction materials.

1.7.1 Qualification and Duties of SMC Inspectors

The SMC inspectors shall be persons with sufficient training and experience to competently and independently perform the tasks itemized below while under the general supervision of the SMC supervisor. A minimum of one (1) year of comparable experience is required. All SMC inspector shall complete the following tasks:

a. Participate in the selection of stone for the pre-production demonstration stockpile and in the evaluation of stone placed in the stockpile.

b. Complete and submit daily inspection reports in a timely manner.

c. Insure all stones has been cleaned of dirt and dust allowing the stone material to be visual inspected.

d. Perform visual inspection of all armor and chinking stones, with particular attention to individually picked stones (i.e., stones not graded with a screen or grizzly). The examination shall focus on all hairline width fractures, all cracks, defective stone geology and other indicators that may cause the stone to deteriorate into smaller pieces after it is in place in the work. Inspection duties also include identifying and marking pieces that do not meet the criteria for acceptability, including size and shape. Rejected stone shall be marked with a highly visible spray painted red X.

e. Place an identifying paint spray mark or marks on each acceptable individually picked stone.

f. Assure that the Contractor places the accepted pieces of stone into the appropriate stockpiles and placement location in accordance with the respective gradation ranges.

g. Assure that all rejected stone materials are either placed in a "reject" stockpile, are sent directly to a crusher, or are removed from the site immediately after they are so marked. Rejected stones shall not be mingled with accepted stones at any time.

h. Maintain a running average of the per stone weight per gradation range for individually picked stones as they are transported from the site. Net weight of truck loads divided by the number of stones on the load may be used to determine an average stone weight in lieu of weighing individual stones.

For gradation of individually picked stones which have not been weighed on trucks before being loaded on a vessel, determine tonnage of each gradation range loaded on the vessel by using displacement measurements, and determine the average stone weight by dividing the applicable tonnage by the number of stones. These measurements and calculations shall be made prior to the time the vessel departs from the loading location and are for quality control purposes only, to assure that material being shipped has satisfactory unit weights. If acceptance criteria is not met, the vessel shall not be dispatched to the project site. These measurements and calculations are not to be used for measurements for payment.

PART 2 PRODUCTS

2.1 STONE

2.1.1 General

The stone materials to be furnished shall meet all requirements specified herein. Stone shall consist of fresh, sound, hard, dense, durable rock which shall be separated from bedrock by quarrying. Required inspection of all armor stone by the Contractor's SMC supervisor or inspectors shall be as required in this section. Stone shall also meet all testing criteria specified in this section. Testing criteria is outlined in paragraph 2.1.6 herein. The COR shall, at any time during the contract, reject any stone material not meeting specification requirements at the source, transfer point(s), or job site. Stone material which has been delivered to the project site and is rejected, whether in stockpile or in place in the structure, shall be both removed from the project site and replaced at the Contractor's expense. When directed to do so by the COR, rejected stones

shall be returned to the stone's source at the Contractor's expense for the purpose of visually showing the SMC inspectors and quarry operators examples of stones which will not be acceptable in the project's structure, in lieu thereof, the SMC inspectors and quarry operators may be brought to the project site at the Contractor's expense for the same purpose.

2.1.2 Material Quality

All stone shall be of a quality to insure permanence of structure during its designed project life in the climate and conditions in which it is to be used. Selected granite, quartzite, gabbro, diabase, dolomite, some dolomitic limestones, and limestone will meet the requirements of these specifications. All stone utilized shall be free of continuous cracks and fractures and shall not contain deleterious features such splits, spalls, delaminations, disaggreations, dissolvement, shalely parting, or any combination of such features. Stone not meeting these criteria shall be rejected by the COR or SMC inspector. Additionally, any stone with features such as stylolites, seams, lenses, and bands of similar or different lithologic material which tend to form planes of weakness along which the stone material breaks or separates shall be rejected. The Contractor shall insure that all dirt and/or dust is cleaned off of each stone allowing for visual inspection. If by visual examination, it is determined that five (5) percent or more of the stone is fractured or cracked, all stone shall be rejected until the percentage of stone with fractures or cracks provided by the quarry's production process is brought into compliance with the criteria. Criteria used by the Contracting Officer for a "fractured" or "cracked" stone is: "any stone which contains one visible and continuous crack or fracture exposed on two or more faces of the stone; or any armor stone which contains two or more visible continuous cracks or fractures exposed on any one face of the stone." A continuous crack or fracture is defined as "an exposed unbroken and uninterrupted visible crack or fracture with a length equal to or greater than one-half of the dimension of the face on which it is exposed." Evaluation of a crack or fracture along a stone face shall only be based upon length, not width. All stone shall also be free of any detrimental geologic features such as, but not limited, to: clay or shale seams, argillaceous material, weak styolites, schistose seams, detrimental vugs zones of high foliation, and/or other adverse diagenetic features. Inclusion of objectionable quantities of dirt, sand, clay, chert, and rock fines or other deleterious materials shall not be permitted. All stone shall be highly resistant to weathering and disintegration under freezing and thawing and wetting and drying conditions.

2.1.3 Gradation

Stone shall conform to the following gradations:

Armor Stone - An armor stone shall consist of select quarry stone ranging between 300 and 900 pounds. In addition, at least 50% of the individual stones shall weigh at least 600 pounds.

Chinking Stone - A chinking stone shall consist of select quarry stone ranging between 25 and 150 pounds.

Bedding/Core Stone - Bedding/core Stone shall consist of graded stone ranging between40 and 110 pounds.

2.1.4 Size and Shape of Stone

Armor and chinking stone shall be furnished in blocky and angular shapes, with its greatest dimension not greater than three times its least dimension. The maximum dimension of a stone shall be defined as the maximum distance that can be obtained between two parallel planes by placing and rotating, in all directions, the stone between the planes while having the stone "touch" both planes. The minimum dimension of a stone shall be defined as the minimum distance that can be obtained by the procedures specified above. All flat stones, slabs, boulders and parts of boulders will be rejected. A boulder is here defined as "any rounded stone material not having sharp edges."

2.1.5 Petrography and X-Ray Diffraction

Armor and chinking stone shall be subjected to petrographic and x-ray diffraction analysis in accordance with ASTM C-295. Rock shall be fresh (no signs of weathering), interlocking crystalline structure, and free of objectionable material such as expansive clays. Crystalline structure refers to igneous, metamorphic, or sedimentary rock texture consisting of interlocking, crystalline grains. Matrices of any rock consisting of argillite, sericite, smectite, talc, chloritic, soft material, or highly weathered material shall be identified and noted. The petrographic examination shall be conducted by a Petrographer trained in the profession of Petrography. Photographs of stone material examined shall accompany the petrography testing results.

2.1.6 Evaluation Testing

Testing for the purpose of evaluating the proposed stone source or combination of stone sources shall be made at the Contractor's expense. Selection of stone quality control testing samples shall be made under supervision of the COR and shipped to an independent geotechnical laboratory. Stone shall satisfy the following test criteria:

Property Test	Method	Test Value
Petrography & X-Ray Diffraction	ASTM C-295	Fresh, interlocking crystalline, with few vugs(petrology),no planes of weakness, no clay minerals * and no soluble minerals
Specific Gravity	ASTM C-97	2.65 minimum
Absorption	ASTM C-127	Less than 1%
Abrasion	ASTM C-535	Less than 20% loss for 500 revolutions
Magnesium Sulfate Soundness	ASTM C-88	Less than 5% loss
Freezing and Thawing	CRD C 144	Less than 10% loss for 12 cycles *
Wetting and Drying	CRD C 169	No major progressive Cracking *

*Note: indicates that photographs taken before and after testing should

accompany test reports

2.2 SOURCES OF STONE

The Contractor may utilize one or more stone sources (quarries) during the period of this contract; however, each quarry must be identified in a Stone Source submittal. The Contractor shall submit to the Contracting Officer all available service records from each quarry, which reflect the ability of the quarry to produce stone meeting the criteria specified herein. The written submittal shall include such information as quarry location, areas of the quarry producing stone, ledges, specific strata, quarrying procedures/practices, lithology, geologic structure, service records from similar marine usage, and other data including available laboratory test records. The written submittal shall also include each lithology proposed as source material to be used in armor, chinking and bedding/core stone production, geologic structure of local formation, local rock out cropping pattern and structure including joint and fracturing sets, quarry location, total quarry reserve estimates, QA/QC practices, total daily production rates for each class of stone material produced, description of armor stone, chinking, and bedding/core stone production method which shall include all equipment used in this production, estimated production cost per ton of armor, chinking and bedding/core stone products, and other data including prior laboratory testing records from each source. The written submittal shall likewise include both a general and site specific map for each source. The general map will show the local region of the quarry including major access and shipping routes. The site specific map should fully define the area of operations within the quarry including the boundaries and working benches of the quarry and should be of high resolution. The written submittal shall discuss and identify at least two separate sites where the Contracting Officer, or his designated representative, may observe that stone of the sizes required herein have performed satisfactorily for each source. All testing required, for determining stone in the Stone Source submittal, shall be at the Contractor's. The Stone Source Submittal shall be prepared by a state licensed Professional Geologist. Both draft and final copies of each Stone Source Submittal shall be stamped with official seal by the state licensed Professional Geologist preparing these submittals. After Government receipt of the Stone Source submittal but before stone placement, the quarry shall also be subsequently inspected by the Contracting Officer, or his designated representative, to verify the presence of material that meets all requirements specified herein.

2.3 TESTING AND APPROVAL FOR STONE QUALITY

2.3.1 Stone Approval

The acceptability and approval of the stone shall be determined from the following: existing test reports, stone source submittal(s), stone material control submittal(s), service records from similar marine usage, visual SMC QC examination of geological and structural features of each stone unit, and examination of the quarry, and by stone testing results for each distinctive type of lithology produced in the quarry. Visual SMC QC inspection will consider distinctions based on color, massiveness, structural features, and other visual characteristics such as: detrimental cracks, fractures, seams, stylolites, splits, lenses or any other geologic, lithologic, or structural defects which tend to increase deterioration from natural causes or cause breakage during handling or placing. The tests to which the materials will be subjected include petrographic analysis, x-ray

diffraction, specific gravity, abrasion, absorption, unit weight determination, sulfate soundness, wetting and drying, freezing and thawing and unconfined compressive strength, and such other tests as may be considered necessary to demonstrate to the satisfaction of the Contracting Officer that the materials are acceptable for use in the work. Approval of any source of stone shall not be construed as approval of all of the stone produced from that source or bench. All required testing shall be performed by an independent and Government approved lab and at the expense of the Contractor. Prior to shipment of any stone material to the construction site, the Contractor shall submit test results for stone material produced from each source. All stone shall will be subject to Government QA inspection during loading at the source, at intermediate transfer points and at the site of work prior to placement.

2.3.2 Stone Testing

The Contractor, in the consultation with the Contracting Officer or his designated representative (COR), shall select samples of representative stone material from "each distinctive lithologic stratum, bed, or change of material type" in the quarry used on this project. Distinct lithologies, stratum, beds, or any change in material type should be defined in the Stone Source submittal. The Contractor shall also provide to the Contracting Officer duplicate samples. Acceptability of the stone shall be based on the results of testing as specified in paragraph 2.1 "STONE," and visual SMC inspection of each armor and chinking stone as specified in the above paragraphs. The minimum rock quality criteria which must be met are those specified in paragraph 2.1 and applicable subparagraphs. In addition to the minimum criteria, other criteria determined from the tests or QC/QA inspections listed above may be used to establish the acceptability of the stone. The Government may conduct QA testing on some or all of the duplicate stone samples submitted by the Contractor. All tests shall be made by or under the supervision of the Contracting Officer. The right is reserved to reject certain localized areas, strata, or channels within the approved source when in the opinion of the Contracting Officer, the stone is disintegrated, badly weathered, contains incipient planes of weakness or hidden joints/fractures, or is otherwise unsatisfactory for use in the work as specified herein. The Government also reserves the right to collect and test stone sample from any production point in an approved source without the consent of the quarry operators.

2.4 STONE NOT MEETING THE SPECIFICATIONS

If, during the progress of the work, it is found that the stone being furnished and/or placed by the Contractor does not fully meet all the requirements of the specifications, the Contractor shall be required to furnish other stone that meets the requirements of these specifications. Any stone rejected at the site of the work as not meeting the requirements of these specifications for quality, condition, size, gradation or otherwise shall be removed from the site by and at the expense of the Contractor, and stone meeting the requirements of the specification shall be furnished and/or placed by the Contractor at no additional cost to the Government. The Contractor shall remove and dispose of all rejected stone in a manner approved by the Contracting Officer.

2.4.1 Stone Breakage

Stones which are broken during shipment to the work site or during placement shall be re-weighed and may be rejected if the new weight of the broken unit does not meet gradation requirements. Stones broken in

placement shall be removed from the structure and returned to the stockpile area to accomplish re-weighing.

2.5 PRODUCTION STOCKPILES OF STONE

After inspection and approval of the armor, chinking, and bedding/core stone units within a stockpile by the SMC inspector, stockpiles for the armor, chinking, and bedding/core stone may be maintained at each quarry (stone source), intermediate transfer points, and at the work site. The area where the inspected and approved stockpiles are maintained shall be in a separate and inaccessible area to all other construction and/or stone production activities or areas where different size ranges not be may be mixed. If the inspected and approved stockpile will be maintained at the production source of the stone, stockpile integrity shall be insured by surrounding the stockpile by yellow caution tape secured on wooden or metal posts driven into the ground. The SMC inspector(s) shall insure that no additional stone material is placed in the inspected production stockpile. The SMC inspector(s) shall likewise insure that no material in the inspected and approved stockpile is removed unless shipped to the project site. At no time during the temporary storage of the production stockpile stone should material which has been rejected and marked with a red X be allowed to be stored with or adjacent to the inspected production stockpile.

2.6 PRODUCTION QUALITY CONTROL

2.6.1 Visual Inspections

Daily SMC inspection of all the armor and chinking stone produced for the project structure shall be made by the SMC inspector(s) at the quarry, and before loading, for size, gradation, elongation, cracks and fractures, deterioration, and other visible defects on the entire area of stone. Procedures outlined in the SMC plan submitted by the Contractor shall be followed. The stone material shall be kept clean of dirt and dust allowing SMC inspector(s) to visual inspection of each stone. If directed by the Contracting Officer, stones shall be spread out in the quarry for visual inspection before loading for delivery and stones shall be rotated to allow for visual inspection of all faces. No separate or additional payments shall be made to the Contractor for spreading or rotating stones for the sake of performing visual inspections. The daily SMC inspections shall also include comparing the material being produced to that which exists in the pre-production demonstration stockpile. If any significant reduction in overall stone quality, gradation mix, or required sizes are observed to be occurring, the SMC supervisor shall initiate corrective action. Each day, 5 of the largest acceptable stones, with the lowest potentially acceptable quality, shall be fully wetted and visibly re-inspected by the Contractor while wet for cracks, fractures, deterioration, and other visible defects as described in these specifications, to determine if re-inspections are necessary on all stones Re-inspection of all stones ready for loading that day shall be required if any of the 5 wetted stones are rejected. All rejected stones, those not meeting the requirements of these specifications, shall be visibly marked with a reject symbol (painted red X) and shall not be shipped to the project site.

2.6.2 Project Construction Site Inspection and Tests

At the project construction site, random visual inspections shall be made of all materials by the Contractor for size, gradation, elongation, fractures, deterioration, and other defects to assure that handling during loading, transporting, unloading, and placement has not caused damage to

the materials and to assure they are placed in accordance with requirement of this Section. Weighing of stones or re-measuring them shall be performed to verify computed weight when the COR brings the size of specific stones into question or when the SMC inspector observes the need to do so. Except as allowed by gradation tolerance, any material broken, cracked or fractured, out of gradation or weight limitation, or improperly placed in the work shall be removed and replaced with satisfactory stones and corrective action taken at no additional cost to the Government. Rejected material shall be promptly removed form the project site or disposed of at the project site in a location established by the COR. Such materials shall be excluded from measurement for payment.

2.7 QUALITY ASSURANCE

During the contract period, both prior to and after the materials are delivered to the job site, visual QA inspection and measurements records of all stones produced for this project shall be required. If the COR, during the QA inspection, finds that the stone quality, gradation or weights of the stone being furnished are not as specified or are questionable, re-sampling and re-testing by the Contractor may be required, at no additional cost to the Government. Sampling of the delivered stone for testing and the manner in which the testing is to be performed shall be as directed by the COR. This additional sampling and testing shall be performed at the Contractor's expense.

2.8 MATERIAL ACCEPTABILITY

The Government reserves the right to reject stone material from certain localized areas, zones, strata, or channels of any prior approved source, when such materials are determined by the Contracting Officer not to be in compliance with specifications herein. Rejection or disapproval of any source or any material in an approved source by the Contracting Officer shall not be grounds for time extension nor for a change in the contract price.

PART 3 EXECUTION

3.1 EXCAVATION

Excavation of foundation material along the breakwater and sill alignment shall be performed to the required depth, as shown on the contract drawings, over the full width of the breakwater and sill. Side slopes shall be maintained at 1 horizontal : 1 vertical or flatter as necessary, and such that the limit of excavation is a minimum of 6 feet outside of the projected breakwater and sill toe or as otherwise directed or approved the Contracting Officer. The Contractor will be responsible for maintaining the excavated grades and side slopes to the required limits until placement of the stonework is completed in the reach where excavation is accomplished. Prior to initiation of excavation, the Contractor shall submit to the Contracting Officer for approval his proposed method of excavation. This submittal shall include, at a minimum, the type of dredge plant or type of mechanical excavation equipment the Contractor intends to use, the method to be used for controlling the excavation lines and grades, and the means of transporting the excavated materials to the sand fill site.

3.2 PLACEMENT

3.2.1 Method

Prior to initiation of any construction activities under this contract, the Contractor shall submit in duplicate to the Contracting Officer for approval, his proposed placement methods for the stone materials to meet the grades, tolerances, and conditions specified herein. This submittal shall include, but not be limited to, a description of the equipment proposed for use in hauling, placing, and positioning the stone in place, as well as the method of placement and positioning of stone. Approval of this submittal by the Contracting Officer will not relieve the Contractor of achieving a structure constructed to the grades, tolerances, and conditions specified. If, in the opinion of the Contracting Officer, the Contractor is not achieving the required results from his placement operations, any and all adjustments in the Contractor's operations shall be made as deemed necessary as directed or approved by the Contracting Officer.

3.2.2 Foundation Preparation

Prior to the placement of stone materials or geotextile in any area of work, all debris shall be cleared from the area by the Contractor as directed by the Contracting Officer and disposed of in an approved manner.

3.3 BEDDING/CORE STONE

After the geotextile is placed in accordance with the provisions of Section 02379, "Geotextile", bedding/core stone shall be placed to the lines and grades indicated on the drawings. Bedding/core stone in place shall be a reasonably well graded mass with minimum practicable void space. Placing the material by dumping or by other such methods which tend to segregate particle sizes will not be permitted. Compaction of the bedding/core stone shall be accomplished by the controlled use of the hauling and spreading equipment or by other acceptable means approved by the Contracting Officer. A tolerance of plus 3-inches measured perpendicular to the exterior surface of the bedding/core stone from the lines and grades shown on the Drawings will be permitted except that the extreme of such tolerance shall not be continuous over an area greater than 100 square feet. No minus tolerance will be permitted.

3.4 ARMOR STONE

Armor stone shall be placed on completed sections of Bedding/Core Stone, or directly on the geotextile as indicated on the contract drawings. Armor stone shall be placed in a timely manner to protect the bedding/core stone layers to assure maximum interlocking. Stones shall be keyed and fitted, maximizing contact on all sides to result in minimal void space between adjacent stones. Armor stone shall be carefully placed to ensure proper positioning and contact with adjacent stones. Armor stones shall be individually placed and shall not be dropped or tipped into position, but shall be placed piece by piece into the structure to achieve a minimum "three-point support" and be stable to the lines and grades shown on the Drawings. "Three point support" requires contact with at least three separate adjacent stones, not to include underlying stones. Individual stones shall be carefully sorted, chosen, and placed (according to their dimensions) to meet the required grades and tolerances. Placement shall be controlled to avoid clustered placement of weights in the lower portion of the permitted range. The long or intermediate axis of the stone shall be placed perpendicular to the structure face. The top of the finished armor stone layer shall be reasonably smooth with no abrupt changes or discontinuities between the exposed surfaces of adjacent stones. For outer layer, a tolerance of plus 6-inches or minus 3-inches measured

perpendicular to the exterior surface of the stonework from the lines and grades shown on the Drawings shall be permitted except that either extreme of such tolerance shall not be continuous for an area greater than 100 square feet. The intention is that the breakwater and sill will be built to the required elevations, slopes, grades and tolerances and that the outer surface be even and present a generally neat appearance. Placed material not meeting these limits shall be removed and replaced as directed by the Contracting Officer.

3.5 CHINKING OF ARMOR STONE

Following placement of the armor stones, the remaining spaces between individual stones along the landward side of the breakwater and sill at the stone/sand fill interface shall be filled with pieces of smaller stone obtained from the required stone grade materials being supplied for this contract. The spaces between armor stones shall be filled with selected stones of the maximum size which will fit in each remaining space.

3.6 TEMPORARY PROTECTION

If the Contractor anticipates that construction of the stonework will be interrupted for more than four (4) continuous days including holidays and weekends, he shall provide, at his expense, such temporary stone protection necessary to protect all stonework that has been placed. Adequate temporary protection shall also be placed in the event potential damage is anticipated from a predicted storm.

3.7 SLIDES

In the event of the sliding or failure of any part of the structure during its construction, or after its completion, but prior to its acceptance, the Contractor shall, upon written order of the Contracting Officer, cut out and remove the slide from the structure and then rebuild that portion of the structure with new materials or reuse the displaced materials for rebuilding if deemed appropriate. The Contracting Officer shall determine the nature and cause of the slide. In case the slide is caused through fault of the Contractor, the foregoing operations shall be performed without cost to the Government.

3.8 GRADATION QUALITY CONTROL

3.8.1 General

The Contractor shall establish and maintain quality control to assure compliance with contract requirements and shall maintain records of his quality control for all construction operations required under this section. A copy of these records, as well as records of corrective action taken, shall be furnished to the Government as required in Section 01451 CONTRACTOR QUALITY CONTROL. The Contractor shall provide all personnel, plant, equipment, and materials necessary to accomplish the testing required to ensure the material used is within the specified limits and is placed in accordance with these specifications. Reports of all tests performed shall be furnished the Contracting Officer in duplicate. Reports will show all pertinent computations in arriving at the final results.

3.8.2 Bedding/Core Stone

The gradation of the bedding/core stone shall be checked by the Contractor by the performance of sieve analyses, the results of which shall be

furnished the Contracting Officer prior to the delivery of the material to the site of placement. The sieve analysis shall be performed in accordance with Corps of Engineers EM 1110-2-1906. A minimum of two (2) tests shall be performed on representative samples.

3.8.3 Armor Stone

The Contractor shall make arrangements to provide a pre-production demonstration stockpile for armor stone and make all the required weighing and measurement to determine the acceptability of the samples. Sampling, weighing, and measuring operations shall start at least 20 days prior to the anticipated start of stone placement unless otherwise approved by the Contracting Officer. The COR shall be present during all weighing, measuring, and marking of armor stone units in the demonstration stockpile. The demonstration stockpile shall be located at the source of the stone and be shaped in windrow fashion. Other requirements for demonstration stockpiles are specified in paragraph 1.6 DEMONSTRATION STOCKPILE. The Contracting Officer also reserves the right to reject any stone that is found not to meet stone criteria defined herein.

3.8.3.1 Armor Gradation Testing

During construction of the project structure, the gradation of the armor stone shall be also checked by the Contractor by the performance of gradation testing. A minimum of two (2) tests shall be performed on production stockpiles which are 40 tons in size. The Contractor shall provide standard-make scales so that the weight of each stone can be determined. The Contractor shall weight and record the weight of each stone in the selected production stockpile. The results of these tests shall be recorded by the Contractor and delivered to the Contracting Officer at the completion of each test. The Contracting Officer's Representative shall be present during all gradation testing. Failure of a gradation test will result in immediate armor stone gradation testing on the next sequential production stockpile 40-tons in size. Subsequent gradation testing conducted due to a prior gradation test failure shall not be counted towards the two (2) gradation test minimum. Failure of three consecutive armor stone production stockpile's gradations will result in rejection of the stone source producing stone material. Contractor shall provide standard make scales at site to verify weights as directed by the Contracting Officer.

3.8.3.2 Chinking Stone Gradation Testing

During construction of the project structure, the gradation of the chinking shall be also checked by the Contractor by the performance of gradation testing. A minimum of two (2) tests shall be performed on production stockpiles which are 40 tons in size. The Contractor shall provide standard-make scales so that the weight of each stone can be determined. The Contractor shall weight and record the weight of each stone in the selected production stockpile. The results of these tests shall be recorded by the Contractor and delivered to the Contracting Officer at the completion of each test. The Contracting Officer's Representative shall be present during all gradation testing. Failure of a gradation test will result in immediate chinking stone gradation testing on the next sequential production stockpile 40-tons in size. Subsequent gradation testing conducted due to a prior gradation test failure shall not be counted towards the two (2) gradation test minimum. Failure of three consecutive chinking stone production stockpile's gradations will result in rejection of the stone source producing stone material. Contractor shall provide

standard make scales at site to verify weights as directed by the Contracting Officer.

3.9 MEASUREMENT AND PAYMENT

3.9.1 General

Measurement and payment shall be in accordance with Section 01270 MEASUREMENT AND PAYMENT.

-- End of Section --

SECTION 02630

STORM-DRAINAGE SYSTEM

PART 1 GENERAL

1.1 DESCRIPTION

The work covered under this section consists of furnishing all labor, material, equipment, testing and incidentials necessary to install the storm drain culvert as shown on the Contract Drawings in accordance with the Specifications and applicable Drawings.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 167	(1994) Corrugated Steel Structural Plate, Zinc Coated, for Field Bolted Pipe
AASHTO M 190	(1995) Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M 243	(1996) Field Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 798/A 798M	(1997a) Installing Factory-Made Corrugated Steel Pipe for Sewers and Other Applications
ASTM D 1056	(1998) Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM D 1171	(1994) Rubber Deterioration - Surface Ozone Cracking Outdoors or Chamber (Triangular Specimens)
ASTM D 1557	(1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))
ASTM D 2167	(1994) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2922	(1996) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

ASTM D 3017	(1988; R 1996el) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-13 Certificates

Pipeline Testing
Determination of Density

Certified copies of test reports demonstrating conformance to applicable pipe specifications, before pipe is installed.

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless directed otherwise by the Contracting Officer.

1.4.2 Handling

Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

PART 2 PRODUCTS

2.1 PIPE FOR CULVERT

Pipe for culvert shall be of the size indicated and shall conform to the requirements specified.

2.1.1 Steel Pipe Arch

Assembled with galvanized steel nuts and bolts, from galvanized corrugated steel plates conforming to AASHTO M 167. Pipe coating, when required, shall conform to the requirements of AASHTO M 190 Type A. Thickness of plates shall be as indicated.

2.2 MISCELLANEOUS MATERIALS

2.2.1 Joints

2.2.1.1 Flexible Watertight, Gasketed Joints

a. Gaskets: When infiltration or exfiltration is a concern for pipe lines, the couplings may be required to have gaskets. The closed-cell expanded rubber gaskets shall be a continuous band approximately 7 inches wide and approximately 3/8 inch thick, meeting the requirements of ASTM D 1056, Type 2 A1, and shall have a quality retention rating of not less than 70 percent when tested for weather resistance by ozone chamber exposure, Method B of ASTM D 1171. Rubber O-ring gaskets shall be 13/16 inch in diameter for pipe diameters of 36 inches or smaller and 7/8 inch in diameter for larger pipe having 1/2 inch deep end corrugation. Rubber O-ring gaskets shall be 1-3/8 inches in diameter for pipe having 1 inch deep end corrugations.

b. Connecting Bands: Connecting bands shall be of the type, size and sheet thickness of band, and the size of angles, bolts, rods and lugs as indicated or where not indicated as specified in the applicable standards or specifications for the pipe. Exterior rivet heads in the longitudinal seam under the connecting band shall be countersunk or the rivets shall be omitted and the seam welded. Watertight joints shall be tested and shall meet the test requirements of paragraph HYDROSTATIC TEST ON WATERTIGHT JOINTS.

PART 3 EXECUTION

3.1 EXCAVATION FOR PIPE CULVERT

Excavation of trenches, and for appurtenances and backfilling for culverts, shall be in accordance with the applicable portions of Section 02300 "Earthwork", Section 02220 "Demolition" and the requirements specified below.

3.1.1 Trenching

The width of trenches at any point below the top of the pipe shall be not greater than the outside diameter of the pipe plus 24 inches to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe. Sheeting and bracing, where required, shall be placed within the trench width as specified. Contractor shall not overexcavate. Where trench widths are exceeded, redesign with a resultant increase in cost of stronger pipe or special installation procedures will be necessary. Cost of this redesign and increased cost of pipe or installation shall be borne by the Contractor without additional cost to the Government.

3.1.2 Removal of Unstable Material

Where wet or otherwise unstable soil incapable of properly supporting the pipe, as determined by the Contracting Officer, is unexpectedly encountered in the bottom of a trench, such material shall be removed to the depth required and replaced to the proper grade with select granular material, compacted as provided in paragraph BACKFILLING. When removal of unstable material is due to the fault or neglect of the Contractor in his performance of shoring and sheeting, water removal, or other specified requirements, such removal and replacement shall be performed at no additional cost to the government.

3.2 BEDDING

The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe.

3.2.1 Corrugated Metal Pipe

Bedding for corrugated metal pipe arch shall be in accordance with ASTM A 798/A 798M. It is not required to shape the bedding to the pipe geometry. However, for pipe arches, the Contractor shall either shape the bedding to the relatively flat bottom arc or fine grade the foundation to a shallow v-shape.

3.3 PLACING PIPE

Each pipe shall be thoroughly examined before being laid; defective or damaged pipe shall not be used. Pipe shall be laid to the grades and alignment indicated. Proper facilities shall be provided for lowering sections of pipe into trenches. Lifting lugs in vertically elongated metal pipe shall be placed in the same vertical plane as the major axis of the pipe. Pipe shall not be laid in water, and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. Deflection of installed pipe shall not exceed the following limits:

TYPE OF PIPE	MAXIMUM ALLOWABLE DEFLECTION (%)
Corrugated Steel and Aluminum Alloy	5

Not less than 30 days after the completion of backfilling, the Government may perform a deflection test on the entire length of installed flexible pipe using a mandrel or other suitable device. Installed flexible pipe showing deflections greater than those indicated above shall be retested by a run from the opposite direction. If the retest also fails, the suspect pipe shall be replaced at no cost to the Government.

3.3.1 Pipe Arch

Laying shall be with the separate sections joined firmly together, with the outside laps of circumferential joints pointing upstream, and with longitudinal laps on the sides. Part paved pipe shall be installed so that the centerline of bituminous pavement in the pipe, indicated by suitable markings on the top at each end of the pipe sections, coincides with the specified alignment of pipe. Fully paved steel pipe or pipe arch shall have a painted or otherwise applied label inside the pipe or pipe arch indicating sheet thickness of pipe or pipe arch. Any unprotected metal in the joints shall be coated with bituminous material as specified in AASHTO M 190 or AASHTO M 243. Interior coating shall be protected against damage from insertion or removal of struts or tie wires. Lifting lugs shall be used to facilitate moving pipe without damage to exterior or interior coatings. During transportation and installation, pipe or pipe arch and coupling bands shall be handled with care to preclude damage to the coating, paving or lining. Damaged coatings, pavings and linings shall be repaired in accordance with the manufacturer's recommendations prior to placing backfill. Pipe on which coating, paving or lining has been damaged to such an extent that satisfactory field repairs cannot be made shall be removed and replaced. Vertical elongation, where indicated, shall be accomplished by factory elongation. Suitable markings or properly placed lifting lugs shall be provided to ensure placement of factory elongated

pipe in a vertical plane.

3.4 JOINTING

3.4.1 Corrugated Metal Pipe

3.4.1.1 Field Joints

Transverse field joints shall be designed so that the successive connection of pipe sections will form a continuous line free of appreciable irregularities in the flow line. In addition, the joints shall meet the general performance requirements described in ASTM A 798/A 798M. Suitable transverse field joints which satisfy the requirements for one or more of the joint performance categories can be obtained with the following types of connecting bands furnished with suitable band-end fastening devices: corrugated bands, bands with projections, flat bands, and bands of special design that engage factory reformed ends of corrugated pipe. The space between the pipe and connecting bands shall be kept free from dirt and grit so that corrugations fit snugly. The connecting band, while being tightened, shall be tapped with a soft-head mallet of wood, rubber or plastic, to take up slack and ensure a tight joint. The annular space between abutting sections of part paved, and fully paved pipe and pipe arch, in sizes 30 inches or larger, shall be filled with a bituminous material after jointing. Field joints for each type of corrugated metal pipe shall maintain pipe alignment during construction and prevent infiltration of fill material during the life of the installations. The type, size, and sheet thickness of the band and the size of angles or lugs and bolts shall be as indicated or where not indicated, shall be as specified in the applicable standards or specifications for the pipe.

3.4.1.2 Flexible Watertight, Gasketed Joints

Installation shall be as recommended by the gasket manufacturer for use of lubricants and cements and other special installation requirements. The gasket shall be placed over one end of a section of pipe for half the width of the gasket. The other half shall be doubled over the end of the same pipe. When the adjoining section of pipe is in place, the doubled-over half of the gasket shall then be rolled over the adjoining section. Any unevenness in overlap shall be corrected so that the gasket covers the end of pipe sections equally. Connecting bands shall be centered over adjoining sections of pipe, and rods or bolts placed in position and nuts tightened. Band Tightening: The band shall be tightened evenly, even tension being kept on the rods or bolts, and the gasket; the gasket shall seat properly in the corrugations. Watertight joints shall remain uncovered for a period of time designated, and before being covered, tightness of the nuts shall be measured with a torque wrench. If the nut has tended to loosen its grip on the bolts or rods, the nut shall be retightened with a torque wrench and remain uncovered until a tight, permanent joint is assured.

3.5 BACKFILLING

3.5.1 Backfilling Pipe in Trenches

After the pipe has been properly bedded, selected material from excavation or borrow, at a moisture content that will facilitate compaction, shall be placed along both sides of pipe in layers not exceeding 6 inches in compacted depth. The backfill shall be brought up evenly on both sides of pipe for the full length of pipe. The fill shall be thoroughly compacted

under the haunches of the pipe. Each layer shall be thoroughly compacted with mechanical tampers or rammers. This method of filling and compacting shall continue until the fill has reached an elevation of at least 12 inches above the top of the pipe. The remainder of the trench shall be backfilled and compacted by spreading and rolling or compacted by mechanical rammers or tampers in layers not exceeding inches. Tests for density shall be made as necessary to ensure conformance to the compaction requirements specified below. Where it is necessary, in the opinion of the Contracting Officer, that sheeting or portions of bracing used be left in place, the contract will be adjusted accordingly. Untreated sheeting shall not be left in place beneath pavements.

3.5.2 Backfilling Pipe in Fill Sections

For pipe placed in fill sections, backfill material and the placement and compaction procedures shall be as specified below. The fill material shall be uniformly spread in layers longitudinally on both sides of the pipe, not exceeding 6 inches in compacted depth, and shall be compacted by rolling parallel with pipe or by mechanical tamping or ramming. Prior to commencing normal filling operations, the crown width of the fill at a height of 12 inches above the top of the pipe shall extend a distance of not less than twice the outside pipe diameter on each side of the pipe or 12 feet, whichever is less. After the backfill has reached at least 12 inches above the top of the pipe, the remainder of the fill shall be placed and thoroughly compacted in layers not exceeding inches.

3.5.3 Movement of Construction Machinery

When compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe shall be avoided. Movement of construction machinery over a culvert at any stage of construction shall be at the Contractor's risk. Any damaged pipe shall be repaired or replaced.

3.5.4 Compaction

3.5.4.1 General Requirements

Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands. Cohesive materials include clayey and silty gravels, gravel-silt mixtures, clayey and silty sands, sand-clay mixtures, clays, silts, and very fine sands. When results of compaction tests for moisture-density relations are recorded on graphs, cohesionless soils will show straight lines or reverse-shaped moisture-density curves, and cohesive soils will show normal moisture-density curves.

3.5.4.2 Minimum Density

Backfill over and around the pipe and backfill around and adjacent to drainage structures shall be compacted at the approved moisture content to the following applicable minimum density, which will be determined as specified below.

a. Under paved roads and similar-use pavements including adjacent shoulder areas, the density shall be not less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material, up to the elevation where requirements for pavement subgrade materials and compaction shall control.

3.5.5 Determination of Density

Testing shall be the responsibility of the Contractor and performed at no additional cost to the Government. Testing shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. Tests shall be performed in sufficient number to ensure that specified density is being obtained. Laboratory tests for moisture-density relations shall be made in accordance with ASTM D 1557 except that mechanical tampers may be used provided the results are correlated with those obtained with the specified hand tamper. Field density tests shall be determined in accordance with ASTM D 2167 or ASTM D 2922. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted, if necessary, using the sand cone method as described in paragraph Calibration of the referenced publications. ASTM D 2922 results in a wet unit weight of soil and when using this method ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D 3017 or ASTM D 2922. Test results shall be furnished the Contracting Officer. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job on each different type of material encountered and at intervals as directed.

3.6 PIPELINE TESTING

Lines shall be tested for leakage by low pressure air or water testing or exfiltration tests, as appropriate. Prior to exfiltration tests, the trench shall be backfilled up to at least the lower half of the pipe. If required, sufficient additional backfill shall be placed to prevent pipe movement during testing, leaving the joints uncovered to permit inspection. Visible leaks encountered shall be corrected regardless of leakage test results. When the water table is 2 feet or more above the top of the pipe at the upper end of the pipeline section to be tested, infiltration shall be measured using a suitable weir or other device acceptable to the Contracting Officer. An exfiltration test shall be made by filling the line to be tested with water so that a head of at least 2 feet is provided above both the water table and the top of the pipe at the upper end of the pipeline to be tested. The filled line shall be allowed to stand until the pipe has reached its maximum absorption, but not less than 4 hours. After absorption, the head shall be reestablished. The amount of water required to maintain this water level during a 2-hour test period shall be measured. Leakage as measured by the exfiltration test shall not exceed 0.2 gallons per inch in diameter per 100 feet of pipeline per hour. When leakage exceeds the maximum amount specified, satisfactory correction shall be made and retesting accomplished. Testing, correcting, and retesting shall be made at no additional cost to the Government.

3.7 MEASUREMENT AND PAYMENT

3.7.1 General

Measurement and payment shall be in accordance with Section 01270 MEASUREMENT AND PAYMENT.

-- End of Section --

SECTION 02722

AGGREGATE BASE COURSE

PART 1 GENERAL

1.1 DESCRIPTION

The work covered by this section consists of furnishing all labor, materials, equipment and incidentals required to complete aggregate base course in strict accordance with the Specifications and applicable drawings and/or as specified herein. Work shall also include the removal and replacement of culvert crossing St. Martins Road as shown on the Contract Drawings. Contractor to refer to Section 02630 STORM-DRAINAGE SYSTEM for installation specifications of culvert.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 88	(1999a) Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C 117	(1995) Materials Finer Than 75 micrometer (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 127	(1988; R 1993el) Specific Gravity and Absorption of Course Aggregate
ASTM C 128	(1997) Specific Gravity and Absorption of Fine Aggregate
ASTM C 131	(1996) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM D 75	(1987; R 1997) Sampling Aggregates
ASTM D 1556	(1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))

ASTM D 2487	(1998) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 4318	(1998) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM E 11	(1995) Wire-Cloth Sieves for Testing Purposes

1.3 DEFINITIONS

For the purposes of this specification, the following definitions apply.

1.3.1 Aggregate Base Course

Aggregate base course (ABC) is well graded, durable aggregate uniformly moistened and mechanically stabilized by compaction.

1.3.2 Degree of Compaction

Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 .

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Plant, Equipment, and Tools; G

List of proposed equipment to be used in performance of construction work, including descriptive data.

Certified Waybills and Certified Delivery Tickets; G, ED

Copies of waybills and delivery tickets during the progress of the work. Before the final statement is allowed, the Contractor shall file certified waybills and certified delivery tickets for all aggregates actually used.

SD-09 Reports

Sampling and testing; G
Field Density Tests; G

Calibration curves and related test results prior to using the device or equipment being calibrated. Copies of field test results within 24 hours after the tests are performed. Certified copies of test results for approval not less than 30 days before material is required for the work.

1.5 SAMPLING AND TESTING

Sampling and testing shall be the responsibility of the Contractor. Sampling and testing shall be performed by a testing laboratory approved in accordance with Section 01451 CONTRACTOR QUALITY CONTROL. Work requiring testing will not be permitted until the testing laboratory has been inspected and approved. The materials shall be tested to establish compliance with the specified requirements; testing shall be performed at the specified frequency. The Contracting Officer may specify the time and location of the tests. Copies of test results shall be furnished to the Contracting Officer within 24 hours of completion of the tests.

1.5.1 Sampling

Samples for laboratory testing shall be taken in conformance with ASTM D 75. When deemed necessary, the sampling will be observed by the Contracting Officer.

1.5.2 Tests

The following tests shall be performed in conformance with the applicable standards listed.

1.5.2.1 Sieve Analysis

Sieve analysis shall be made in conformance with ASTM C 117 and ASTM C 136. Sieves shall conform to ASTM E 11.

1.5.2.2 Liquid Limit and Plasticity Index

Liquid limit and plasticity index shall be determined in accordance with ASTM D 4318.

1.5.2.3 Moisture-Density Determinations

The maximum density and optimum moisture content shall be determined in accordance with ASTM D 1557.

1.5.2.4 Field Density Tests

Density shall be field measured in accordance with ASTM D 1556 .

1.5.2.5 Wear Test

Wear tests shall be made on ABC course material in conformance with ASTM C 131.

1.5.2.6 Soundness

Soundness tests shall be made on ABC in accordance with ASTM C 88.

1.5.3 Testing Frequency

1.5.3.1 Initial Tests

One of each of the following tests shall be performed on the proposed material prior to commencing construction to demonstrate that the proposed material meets all specified requirements when furnished. If materials from more than one source are going to be utilized, this testing shall be completed for each source.

a. Sieve Analysis .

b. Liquid limit and plasticity index moisture-density relationship.

c. Moisture-density relationship.

d. Wear.

1.5.3.2 In Place Tests

One of each of the following tests shall be performed on samples taken from the placed and compacted ABC . Samples shall be taken and tested at the rates indicated.

a. Density tests shall be performed on every lift of material placed and at a frequency of one set of tests for every 250 square yards , or portion thereof, of completed area.

b. Sieve Analysis shall be performed for every 500 tons , or portion thereof, of material placed.

c. Liquid limit and plasticity index tests shall be performed at the same frequency as the sieve analysis.

1.5.4 Approval of Material

The source of the material shall be selected 21 calendar days prior to the time the material will be required in the work. Tentative approval of material will be based on initial test results. Final approval of the materials will be based on sieve analysis, liquid limit, and plasticity index tests performed on samples taken from the completed and fully compacted ABC.

1.6 WEATHER LIMITATIONS

Construction shall be done when the atmospheric temperature is above 35 degrees F. When the temperature falls below 35 degrees F, the Contractor shall protect all completed areas by approved methods against detrimental effects of freezing. Completed areas damaged by freezing, rainfall, or other weather conditions shall be corrected to meet specified requirements.

1.7 PLANT, EQUIPMENT, AND TOOLS

All plant, equipment, and tools used in the performance of the work will be subject to approval before the work is started and shall be maintained in satisfactory working condition at all times. The equipment shall be adequate and shall have the capability of producing the required compaction, meeting grade controls, thickness control, and smoothness requirements as set forth herein.

PART 2 PRODUCTS

2.1 AGGREGATES

The ABC shall consist of clean, sound, durable particles of crushed stone, crushed gravel, angular sand, or other approved material. ABC shall be free of lumps of clay, organic matter, and other objectionable materials or

coatings. The portion retained on the No. 4 sieve shall be known as coarse aggregate; that portion passing the No. 4 sieve shall be known as fine aggregate.

2.1.1 Coarse Aggregate

Coarse aggregates shall be angular particles of uniform density. When the coarse aggregate is supplied from more than one source, aggregate from each source shall meet the specified requirements and shall be stockpiled separately.

a. Crushed Gravel: Crushed gravel shall be manufactured by crushing gravels, and shall meet all the requirements specified below.

b. Crushed Stone: Crushed stone shall consist of freshly mined quarry rock, and shall meet all the requirements specified below.

2.1.1.1 Aggregate Base Course

ABC coarse aggregate shall not show more than 50 percent loss when subjected to the Los Angeles abrasion test in accordance with ASTM C 131. The amount of flat and elongated particles shall not exceed 30 percent. A flat particle is one having a ratio of width to thickness greater than 3; an elongated particle is one having a ratio of length to width greater than 3. In the portion retained on each sieve specified, the crushed aggregates shall contain at least 50 percent by weight of crushed pieces having two or more freshly fractured faces with the area of each face being at least equal to 75 percent of the smallest midsectional area of the piece. When two fractures are contiguous, the angle between planes of the fractures must be at least 30 degrees in order to count as two fractured faces. Crushed gravel shall be manufactured from gravel particles 50 percent of which, by weight, are retained on the maximum size sieve listed in TABLE 1.

2.1.2 Fine Aggregate

Fine aggregates shall be angular particles of uniform density. When the fine aggregate is supplied from more than one source, aggregate from each source shall meet the specified requirements.

2.1.2.1 Aggregate Base Course

ABC fine aggregate shall consist of screenings, angular sand, crushed recycled concrete fines, or other finely divided mineral matter processed or naturally combined with the coarse aggregate.

2.1.3 Gradation Requirements

The specified gradation requirements shall apply to the completed base course. The aggregates shall have a maximum size of 2.0 inches and shall be continuously well graded within the limits specified in TABLE 1. Sieves shall conform to ASTM E 11.

TABLE I. GRADATION OF AGGREGATES

Percentage by Weight Passing Square-Mesh Sieve

Sieve Designation	Percent Passing
2 inch	100
1-1/2 inch	95-100
3/4 inch	70-92
3/8 inch	50-70
No. 4	35-55
No. 30	12-25
No. 200	0-8

NOTE 1: Particles having diameters less than 0.0008 inch shall not be in excess of 3 percent by weight of the total sample tested.

NOTE 2: The values are based on aggregates of uniform specific gravity. If materials from different sources are used for the coarse and fine aggregates, they shall be tested in accordance with ASTM C 127 and ASTM C 128 to determine their specific gravities. If the specific gravities vary by more than 10 percent, the percentages passing the various sieves shall be corrected as directed by the Contracting Officer.

2.1.4 Liquid Limit and Plasticity Index

Liquid limit and plasticity index requirements shall apply to the completed course and shall also apply to any component that is blended to meet the required gradation. The portion of any component or of the completed course passing the No. 40 sieve shall be either nonplastic or have a liquid limit not greater than 25 and a plasticity index not greater than 5.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

When the ABC is constructed in more than one layer, the previously constructed layer shall be cleaned of loose and foreign matter by sweeping with power sweepers or power brooms, except that hand brooms may be used in areas where power cleaning is not practicable. Adequate drainage shall be provided during the entire period of construction to prevent water from collecting or standing on the working area. Line and grade stakes shall be provided as necessary for control. Grade stakes shall be in lines parallel to the centerline of the area under construction and suitably spaced for string lining.

3.2 OPERATION OF AGGREGATE SOURCES

Aggregates shall be obtained from offsite sources. The Contractor shall provide certified waybills and certified delivery tickets for all aggregates actually used.

3.3 PREPARATION OF UNDERLYING COURSE

Prior to constructing the ABC, the underlying course or subgrade shall be cleaned of all foreign substances. Contractor is to refer to Section 02220

"Demolition" for the removal of the existing culvert and Section 02630 "Storm-Drainage System" for culvert replacement. At the time of construction of the ABC, the underlying course shall contain no frozen material. The surface of the underlying course or subgrade shall meet specified compaction and surface tolerances. The underlying course shall conform to Section 02300 EARTHWORK.Ruts or soft yielding spots in the underlying courses, areas having inadequate compaction, and deviations of the surface from the requirements set forth herein shall be corrected by loosening and removing soft or unsatisfactory material and by adding approved material, reshaping to line and grade, and recompacting to specified density requirements. For cohesionless underlying courses containing sands or gravels, as defined in ASTM D 2487, the surface shall be stabilized prior to placement of the ABC. Stabilization shall be accomplished by mixing ABC into the underlying course and compacting by approved methods. The stabilized material shall be considered as part of the underlying course and shall meet all requirements of the underlying course. The finished underlying course shall not be disturbed by traffic or other operations and shall be maintained by the Contractor in a satisfactory condition until the ABC is placed.

3.4 INSTALLATION

3.4.1 Mixing the Materials

The coarse and fine aggregates shall be mixed in a stationary plant, or in a traveling plant or bucket loader on an approved paved working area. The Contractor shall make adjustments in mixing procedures or in equipment as directed to obtain true grades, to minimize segregation or degradation, to obtain the required water content, and to insure a satisfactory ABC meeting all requirements of this specification.

3.4.2 Placing

The mixed material shall be placed on the prepared subgrade or subbase in layers of uniform thickness with an approved spreader. When a compacted layer 6 inches or less in thickness is required, the material shall be placed in a single layer. When a compacted layer in excess of 6 inches is required, the material shall be placed in layers of equal thickness. No layer shall exceed 6 inches or less than 3 inches when compacted. The layers shall be so placed that when compacted they will be true to the grades or levels required with the least possible surface disturbance. Where the ABC is placed in more than one layer, the previously constructed layers shall be cleaned of loose and foreign matter by sweeping with power sweepers, power brooms, or hand brooms, as directed. Such adjustments in placing procedures or equipment shall be made as may be directed to obtain true grades, to minimize segregation and degradation, to adjust the water content, and to insure an acceptable ABC .

3.4.3 Grade Control

The finished and completed ABC shall conform to the lines, grades, and cross sections shown. Underlying material(s) shall be excavated and prepared at sufficient depth for the required ABC thickness so that the finished ABC with the subsequent surface course will meet the designated grades.

3.4.4 Edges of Base Course

The ABC shall be placed so that the completed section will be a minimum of

2 feet wider, on all sides, than the next layer that will be placed above it. Additionally, approved fill material shall be placed along the outer edges of ABC in sufficient quantities to compact to the thickness of the course being constructed, or to the thickness of each layer in a multiple layer course, allowing in each operation at least a 2 foot width of this material to be rolled and compacted simultaneously with rolling and compacting of each layer of ABC . If this base course material is to be placed adjacent to another pavement section, then the layers for both of these sections shall be placed and compacted along this edge at the same time.

3.4.5 Compaction

Each layer of the ABC shall be compacted as specified with approved compaction equipment. Water content shall be maintained during the compaction procedure to within plus or minus 2.0 percent of the optimum water content determined from laboratory tests as specified in paragraph SAMPLING AND TESTING. Rolling shall begin at the outside edge of the surface and proceed to the center, overlapping on successive trips at least one-half the width of the roller. Alternate trips of the roller shall be slightly different lengths. Speed of the roller shall be such that displacement of the aggregate does not occur. In all places not accessible to the rollers, the mixture shall be compacted with hand-operated power tampers. Compaction shall continue until each layer has a degree of compaction that is at least 95 percent of laboratory maximum density through the full depth of the layer. The Contractor shall make such adjustments in compacting or finishing procedures as may be directed to obtain true grades, to minimize segregation and degradation, to reduce or increase water content, and to ensure a satisfactory ABC . Any materials that are found to be unsatisfactory shall be removed and replaced with satisfactory material or reworked, as directed, to meet the requirements of this specification.

3.4.6 Thickness

Compacted thickness of the aggregate course shall be as indicated. No individual layer shall exceed 8 inches nor be less than 3 inches in compacted thickness. The total compacted thickness of the ABC course shall be within 1/2 inch of the thickness indicated. Where the measured thickness is more than 1/2 inch deficient, such areas shall be corrected by scarifying, adding new material of proper gradation, reblading, and recompacting as directed. Where the measured thickness is more than 1/2 inch thicker than indicated, the course shall be considered as conforming to the specified thickness requirements. Average job thickness shall be the average of all thickness measurements taken for the job, but shall be within 1/4 inch of the thickness indicated. The total thickness of the ABC course shall be measured at intervals in such a manner as to ensure one measurement for each 500 square yards of base course. Measurements shall be made in 3 inch diameter test holes penetrating the base course.

3.4.7 Proof Rolling

Proof rolling of the areas indicated shall be in addition to the compaction specified and shall consist of five passes of a loaded dump truck. In areas designated, proof rolling shall be applied to the top of the underlying material on which ABC is laid and to each layer of ABC . Water content of the underlying material shall be maintained at optimum or at the percentage directed from start of compaction to completion of proof rolling of that layer. Water content of each layer of the ABC shall be maintained

at the optimum percentage directed from start of compaction to completion of proof rolling. Any ABC materials or any underlying materials that produce unsatisfactory results by proof rolling shall be removed and replaced with satisfactory materials, recompacted and proof rolled to meet these specifications.

3.4.8 Finishing

The surface of the top layer of ABC shall be finished after final compaction and proof rolling by cutting any overbuild to grade and rolling with a steel-wheeled roller. Thin layers of material shall not be added to the top layer of base course to meet grade. If the elevation of the top layer of ABC is 1/2 inch or more below grade, then the top layer should be scarified to a depth of at least 3 inches and new material shall be blended in and compacted to bring to grade. Adjustments to rolling and finishing procedures shall be made as directed to minimize segregation and degradation, obtain grades, maintain moisture content, and insure an acceptable base course. Should the surface become rough, corrugated, uneven in texture, or traffic marked prior to completion, the unsatisfactory portion shall be scarified, reworked and recompacted or it shall be replaced as directed.

3.4.9 Smoothness

The surface of the top layer shall show no deviations in excess of 3/8 inch when tested with a 10 foot straightedge. Measurements shall be taken in successive positions parallel to the centerline of the area to be paved. Measurements shall also be taken perpendicular to the centerline at 100 foot intervals. Deviations exceeding this amount shall be corrected by removing material and replacing with new material, or by reworking existing material and compacting it to meet these specifications.

3.5 TRAFFIC

Traffic shall not be allowed on the completed ABC course until approved by the Contracting Officer.

3.6 MAINTENANCE

The ABC shall be maintained in a satisfactory condition until completion of the Saltmarsh Restoration Phase 1 project and accepted by the Contracting Officer. Maintenance shall include immediate repairs to any defects and shall be repeated as often as necessary to keep the area intact. Any area of ABC that is damaged shall be reworked or replaced as necessary to comply with this specification.

3.7 DISPOSAL OF UNSATISFACTORY MATERIALS

Any unsuitable materials that must be removed shall be disposed of as directed. No additional payments will be made for materials that must be replaced.

3.8 MEASUREMENT AND PAYMENT

3.8.1 General

Measurement and payment shall be in accordance with Section 01270 MEASUREMENT AND PAYMENT.

-- End of Section --

SECTION 02921

SEEDING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AGRICULTURAL MARKETING SERVICE (AMS)

AMS-01	(Aug 95) Federal Seed Act Regulations Part 201

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 602	(1995a) Agricultural Liming Materials
ASTM D 4972	(1995a) pH of Soils
ASTM D 5268	(1992; R 1996) Topsoil Used for Landscaping Purposes
ASTM D 5883	(1996) Standard Guide for Use of Rotary Kiln Produced Expanded Shale, Clay or Slate (ESCS) as a Mineral Amendment in Topsoil Used for Landscaping and Related Purposes

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Surface Erosion Control Material; G, ED
Chemical Treatment Material; G

Manufacturer's literature including physical characteristics, application and installation instructions for equipment, surface erosion control material and chemical treatment material.

Equipment

A listing of equipment to be used for the seeding operation.

Delivery; G

Delivery schedule.

Finished Grade and Topsoil; G

Finished grade status.

Topsoil; G, ED

Availability of topsoil from the stripping and stock piling operation.

Quantity Check

Bag count or bulk weight measurements of material used compared with area covered to determine the application rate and quantity installed.

Seed Establishment Period

Calendar time period for the seed establishment period. When there is more than one seed establishment period, the boundaries of the seeded area covered for each period shall be described.

Maintenance Record

Maintenance work performed, area repaired or reinstalled, diagnosis for unsatisfactory stand of grass plants.

SD-09 Reports

Equipment Calibration

Certification of calibration tests conducted on the equipment used in the seeding operation.

Soil Test; G

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-13 Certificates

Seed; G, ED
Topsoil; G, ED
pH Adjuster; G, ED
Fertilizer; G, ED
Soil Conditioner
Mulch

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

a. Seed. Classification, botanical name, common name,

percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.

b. Topsoil. Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.

c. pH Adjuster. Calcium carbonate equivalent and sieve analysis.

d. Fertilizer. Chemical analysis and composition percent.

e. Soil Conditioner: Composition and source.

f. Mulch: Composition and source.

SD-14 Samples

Delivered Topsoil

Samples taken from several locations at the source.

Soil Amendments

A 10 pound sample.

Mulch

A 10 pound sample.

1.3 SOURCE INSPECTION

The source of delivered topsoil shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.4.1.1 Delivered Topsoil

Prior to the delivery of any topsoil, its availability shall be verified in paragraph TOPSOIL. A soil test shall be provided for topsoil delivered to the site.

1.4.1.2 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.4.2 Inspection

Seed shall be inspected upon arrival at the job site for conformity to species and quality. Seed that is wet, moldy, or bears a test date five months or older, shall be rejected. Other materials shall be inspected for compliance with specified requirements. The following shall be rejected:

open soil amendment containers or wet soil amendments; topsoil that contains slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter; and topsoil that contains viable plants and plant parts. Unacceptable materials shall be removed from the job site.

1.4.3 Storage

Materials shall be stored in designated areas. Seed, lime, and fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with seeding operation materials.

1.4.4 Handling

Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Seed Classification

State-certified seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with AMS-01 and applicable state seed laws.

2.1.2 Permanent Seed Species and Mixtures

Permanent seed species and mixtures shall be proportioned by weight as follows:

TABLE 1

Common Name	Mixture Percent by Weight	Percent Pure Live Seed
LAWN SEED		
Kentucky Bluegrass	60	85
Creeping Red Fescue	40	98

2.1.3 Temporary Seed Species

Temporary seed species for surface erosion control or overseeding shall be one of the following mixtures:

TABLE 2

Mixture	Species	Seeding Dates	Rate (#/acre)	Seeding Depths
1	Barley	2/1-4/30; 8/15-10/15	122	1"-2"
	Oats or	2/1-4/30	96	1"-2"
	Rye	2/1-4/30; 8/15-11/30	140	1"-2"

Mixture	Species	Seeding Dates	Rate (#/acre)	Seeding Depths
2	Barley or	2/1-10/15	150	1"
	Rye plus	2/1-11/30	150	1"
	Foxtail Millet			
3	Annual Ryegrass	2/1-4/30; 8/15-11/1	50	1/4"-1/2"

2.1.4 Quality

Weed seed shall be a maximum 1 percent by weight of the total mixture.

2.1.5 Seed Mixing

The mixing of seed may be done by the seed supplier prior to delivery, or on site as directed.

2.1.6 Substitutions

Substitutions will not be allowed without written request and approval from the Contracting Officer.

2.2 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and stockpiled onsite in accordance with Section 02300 EARTHWORK. When additional topsoil is required beyond the available topsoil from the stripping operation, topsoil shall be delivered and amended as recommended by the soil test for the seed specified. Topsoil shall be free from slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter. Topsoil shall be free from viable plants and plant parts.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of pH adjuster, fertilizer and soil conditioners meeting the following requirements. Vermiculite shall not be used.

2.3.1 pH Adjuster

The pH adjuster shall be an agricultural liming material in accordance with ASTM C 602. These materials may be burnt lime, hydrated lime, ground limestone, sulfur, or shells. The pH adjuster shall be used to create a favorable soil pH for the plant material specified.

2.3.2 Fertilizer

The nutrients ratio shall be 10 percent nitrogen, 6 percent phosphorus, and 4 percent potassium. Fertilizer shall be controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorus-potassium ratio. The fertilizer shall be derived from sulphur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micro-nutrients.

2.3.3 Soil Conditioner

Soil conditioner shall be sand, super absorbent polymers, calcined clay, or gypsum for use singly or in combination to meet the requirements of the soil test.

2.3.3.1 Sand

Sand shall be clean and free of toxic materials. Gradation: A minimum 95 percent by weight shall pass a No. 10 sieve and a minimum 10 percent by weight shall pass a No. 16 sieve. Greensand shall be balanced with the inclusion of trace minerals and nutrients.

2.3.3.2 Super Absorbent Polymers

To improve water retention in soils, super absorbent polymers shall be sized and applied according to the manufacturer's recommendations. Polymers shall be added as a soil amendment and be cross-linked polyacrylamide, with an absorption capacity of 250-400 times its weight. Polymers shall also be added to the seed and be a starch grafted polyacrylonitrite, with graphite added as a tacky sticker. It shall have an absorption capacity of 100 plus times its weight.

2.3.3.3 Calcined Clay

Calcined clay shall be granular particles produced from montmorillonite clay calcined to a minimum temperature of 1200 degrees F. Gradation: A minimum 90 percent shall pass a No. 8 sieve; a minimum 99 percent shall be retained on a No. 60 sieve; and a maximum 2 percent shall pass a No. 100 sieve. Bulk density: A maximum 40 pounds per cubic foot.

2.3.3.4 Gypsum

Gypsum shall be commercially packaged, free flowing, and a minimum 95 percent calcium sulfate by volume.

2.3.3.5 Expanded Shale, Clay, or Slate (ESCS)

Rotary kiln produced ESCS material shall be in conformance with ASTM D 5883.

2.4 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region.

2.4.1 Straw

Straw shall be stalks from oats, wheat, rye, barley, or rice, furnished in air-dry condition and with a consistency for placing with commercial mulch-blowing equipment.

2.4.2 Wood Cellulose Fiber

Wood cellulose fiber shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to facilitate placement during application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

2.5 WATER

Water shall be the responsibility of the Contractor, unless otherwise noted. Water shall not contain elements toxic to plant life.

2.6 PESTICIDE

Pesticide shall not be used.

PART 3 EXECUTION

3.1 INSTALLING SEED TIME AND CONDITIONS

3.1.1 Seeding Time

Permanent seed shall be installed from March 1 to May 15 for spring establishment and from August 15 to November 15 for fall establishment.

3.1.2 Seeding Conditions

Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the seeding operations, proposed alternate times shall be submitted for approval.

3.1.3 Equipment Calibration

Immediately prior to the commencement of seeding operations, calibration tests shall be conducted on the equipment to be used. These tests shall confirm that the equipment is operating within the manufacturer's specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation. The calibration test results shall be provided within 1 week of testing.

3.1.4 Soil Test

Delivered topsoil, existing soil in smooth graded areas, and stockpiled topsoil shall be tested in accordance with ASTM D 5268 and ASTM D 4972 for determining the particle size, pH, organic matter content, textural class, chemical analysis, soluble salts analysis, and mechanical analysis. Sample collection on site shall be random over the entire site. Sample collection for stockpiled topsoil shall be at different levels in the stockpile. The soil shall be free from debris, noxious weeds, toxic substances, or other materials harmful to plant growth. The test shall determine the quantities and type of soil amendments required to meet local growing conditions for the seed species specified.

3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil

The Contractor shall verify that finished grades are as indicated on drawings, and the placing of topsoil, smooth grading, and compaction requirements have been completed in accordance with Section 02300 EARTHWORK, prior to the commencement of the seeding operation.

3.2.2 Application of Soil Amendments

3.2.2.1 Applying pH Adjuster

The application rate shall be 50 pounds per 1000 square feet. The pH adjuster shall be incorporated into the soil to a maximum 4 inch depth or may be incorporated as part of the tillage operation.

3.2.2.2 Applying Fertilizer

The application rate shall be 30 pounds per 1000 square feet. Fertilizer shall be incorporated into the soil to a maximum 4 inch depth.

3.2.2.3 Applying Soil Conditioner

The soil conditioner shall be as recommended by the soil test. The soil conditioner shall be spread uniformly over the soil a minimum 1 inch depth and thoroughly incorporated by tillage into the soil to a maximum 4 inch depth.

3.2.2.4 Applying Super Absorbent Polymers

Polymers shall be spread uniformly over the soil as recommended by the manufacturer and thoroughly incorporated by tillage into the soil to a maximum 4 inch depth.

3.2.3 Tillage

Soil on slopes up to a maximum 3-horizontal-to-1-vertical shall be tilled to a minimum 4 inch depth. On slopes between 3-horizontal-to-1-vertical and 1-horizontal-to-1 vertical, the soil shall be tilled to a minimum 2 inch depth by scarifying with heavy rakes, or other method. Rototillers shall be used where soil conditions and length of slope permit. On slopes 1-horizontal-to-1 vertical and steeper, no tillage is required. Drainage patterns shall be maintained as indicated on drawings. Areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of surface erosion or grade deficiencies shall conform to topsoil requirements. The pH adjuster, fertilizer, and soil conditioner may be applied during this procedure.

3.2.4 Prepared Surface

3.2.4.1 Preparation

The prepared surface shall be a maximum 1 inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. The prepared surface shall be completed with a light raking to remove debris.

3.2.4.2 Lawn Area Debris

Debris and stones over a minimum 5/8 inch in any dimension shall be removed from the surface.

3.2.4.3 Field Area Debris

Debris and stones over a minimum 3 inch in any dimension shall be removed from the surface.

3.2.4.4 Protection

Areas with the prepared surface shall be protected from compaction or damage by vehicular or pedestrian traffic and surface erosion.

3.3 INSTALLATION

Prior to installing seed, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of paragraph SITE PREPARATION. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

3.3.1 Installing Seed

Seeding method shall be Broadcast Seeding or Drill Seeding. Seeding procedure shall ensure even coverage. Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used because of the difficulty in achieving even coverage, unless otherwise approved. Absorbent polymer powder shall be mixed with the dry seed at the rate recommended by the manufacturer.

3.3.1.1 Broadcast Seeding

Seed shall be uniformly broadcast at the rate of 7 pounds per 1000 square feet using broadcast seeders. Half the total rate of seed application shall be broadcast in 1 direction, with the remainder of the seed rate broadcast at 90 degrees from the first direction. Seed shall be covered a maximum 1/4 inch depth by disk harrow, steel mat drag, cultipacker, or other approved device.

3.3.1.2 Drill Seeding

Seed shall be uniformly drilled to a maximum 1/2 inch depth and at the rate of 7 pounds per 1000 square feet, using equipment having drills a maximum 7 inches distance apart. Row markers shall be used with the drill seeder. Half the total rate of seed application shall be drilled in 1 direction, with the remainder of the seed rate drilled at 90 degrees from the first direction. The drilling equipment shall be maintained with half full seed boxes during the seeding operations.

3.3.1.3 Rolling

The entire area shall be firmed with a roller not exceeding 90 pounds per foot roller width. Slopes over a maximum 3-horizontal-to-1 vertical shall not be rolled. Areas seeded with seed drills equipped with rollers shall not be rolled.

3.3.2 Hydroseeding

Seed shall be mixed to ensure broadcast at the rate of 5 pounds per 1000 square feet. Seed and fertilizer shall be added to water and thoroughly mixed to meet the rates specified. The application rates of the fertilizer amounts will not exceed the following: nitrogen, maximum of 100 pounds per acre total of soluble nitrogen; phosphorous, maximum of 200 pounds per acre; potassium, maximum of 200 pounds per acre. The time period for the seed to be held in the slurry shall be a maximum 24 hours. Slurry shall be uniformly applied under pressure over the entire area. The hydroseeded area shall not be rolled.

3.3.3 Mulching

3.3.3.1 Straw Mulch

Straw mulch shall be spread uniformly at the rate of 2 tons per acre. Mulch shall be spread by hand, blower-type mulch spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored into the soil surface a minimum of 2 inches immediately following spreading.

3.3.3.2 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.3.3.3 Asphalt Adhesive Tackifier

Asphalt adhesive shall not be permitted.

3.3.3.4 Non-Asphaltic Tackifier

Hydrophilic colloid shall be applied at the rate recommended by the manufacturer, using hydraulic equipment suitable for thoroughly mixing with water. A uniform mixture shall be applied over the area.

3.3.3.5 Wood Cellulose Fiber

Wood cellulose fiber shall be applied in accordance with the manufacturer's recommendations.

3.3.4 Watering Seed

Watering shall be started immediately after completing the seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum 1 inch depth. Run-off and puddling shall be prevented. Watering trucks shall not be driven over turf areas, unless otherwise directed. Watering of other adjacent areas or plant material shall be prevented.

3.4 SURFACE EROSION CONTROL

3.4.1 Surface Erosion Control Material

Where indicated or as directed, surface erosion control material shall be installed in accordance with manufacturer's instructions. Placement of the material shall be accomplished without damage to installed material or without deviation to finished grade.

3.4.2 Temporary Seeding

When directed during contract delays affecting the seeding operation or when a quick cover is required to prevent surface erosion, the areas designated shall be seeded in accordance with temporary seed species listed under Paragraph SEED. The application rate shall be as shown in Table 2.

3.4.2.1 Soil Amendments

When soil amendments have not been applied to the area, the quantity of 1/2 of the required soil amendments shall be applied and the area tilled in accordance with paragraph SITE PREPARATION. The area shall be watered in accordance with paragraph Watering Seed.

3.4.2.2 Remaining Soil Amendments

The remaining soil amendments shall be applied in accordance with the paragraph Tillage when the surface is prepared for installing seed.

3.5 QUANTITY CHECK

For materials provided in bags, the empty bags shall be retained for recording the amount used. For materials provided in bulk, the weight certificates shall be retained as a record of the amount used. The amount of material used shall be compared with the total area covered to determine the rate of application used. Differences between the quantity applied and the quantity specified shall be adjusted as directed.

3.6 RESTORATION AND CLEAN UP

3.6.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the seeding operation shall be restored to original condition at Contractor's expense.

3.6.2 Clean Up

Excess and waste material shall be removed from the seeded areas and shall be disposed offsite. Adjacent paved areas shall be cleaned.

3.7 PROTECTION OF INSTALLED AREAS

Immediately upon completion of the seeding operation in an area, the area shall be protected against traffic or other use by erecting barricades.

3.8 SEED ESTABLISHMENT PERIOD

3.8.1 Commencement

The seed establishment period to obtain a healthy stand of grass plants shall begin on the first day of work under this contract and shall end 3 months after the last day of the seeding operation. Written calendar time period shall be furnished for the seed establishment period. When there is more than 1 seed establishment period, the boundaries of the seeded area covered for each period shall be described. The seed establishment period shall be modified for inclement weather, shut down periods, or for separate completion dates of areas.

3.8.2 Satisfactory Stand of Grass Plants

Grass plants shall be evaluated for species and health when the grass plants are a minimum 1 inch high.

3.8.2.1 Lawn Area

A satisfactory stand of grass plants from the seeding operation for a lawn

area shall be a minimum 20 grass plants per square foot. Bare spots shall be a maximum 6 inches square. The total bare spots shall be a maximum 2 percent of the total seeded area.

3.8.2.2 Field Area

A satisfactory stand of grass plants from the seeding operation for a field area shall be a minimum 10 grass plants per square foot. The total bare spots shall not exceed 2 percent of the total seeded area.

3.8.3 Maintenance During Establishment Period

Maintenance of the seeded areas shall include eradicating weeds, insects and diseases; protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; protecting installed areas from traffic; mowing; watering; and post-fertilization.

3.8.3.1 Mowing

a. Lawn Areas: Lawn areas shall be mowed to a minimum 3 inch height when the turf is a maximum 4 inches high. Clippings shall be removed when the amount cut prevents sunlight from reaching the ground surface.

b. Field Areas: Field areas shall be mowed once during the season to a minimum 3 inch height. Clippings shall be removed when the amount cut prevents sunlight from reaching the ground surface.

3.8.3.2 Post-Fertilization

The application rate shall be 11 pounds per 1000 square feet. A maximum 1/2 pound per 1000 square feet of actual available nitrogen shall be provided to the grass plants. The application shall be timed prior to the advent of winter dormancy and shall be made without burning the installed grass plants.

3.8.3.3 Repair or Reinstall

Unsatisfactory stand of grass plants and mulch shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with paragraph SITE PREPARATION.

3.8.3.4 Maintenance Record

A record of each site visit shall be furnished, describing the maintenance work performed; areas repaired or reinstalled; and diagnosis for unsatisfactory stand of grass plants.

3.9 MEASUREMENT AND PAYMENT

3.9.1 General

Unless otherwise specified in Section 01270, MEASUREMENT AND PAYMENT, no separate measurement and payment will be made for the work performed in this Section 02921, SEEDING, specified herein, and all costs in connection therewith shall be considered a subsidiary obligation of the Contractor, and shall be included in the overall cost of the work.

-- End of Section --

SECTION 06100

ROUGH CARPENTRY

PART 1 GENERAL

1.1 DESCRIPTION

The work covered by this section consists of furnishing all labor, materials, equipment and incidentals necessary to construct the timber observation walkway in strict accordance with the specifications and applicable drawings.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 47	(1989) Ferritic Malleable Iron Castings
ASTM A 153	(1987) Zinc Coating (Hot Dip) on Iron and Steel Hardware
ASTM A 307	(1997) Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
ASTM F 844	(2000) Washers, Steel, Plain (Flat), Unhardened for General Use

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

AWPA A2	(1998) Methods for Analysis of Waterborne Preservatives and Fire Retardant Formulations
AWPA C1	(1997) All Timber Products - Preservative Treatment by Pressure Processes
AWPA C2	(1995) Lumber, Timber, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes
AWPA C18	(1999) Pressure Treated Material in Marine Construction
AWPA P5	(1983) Standard for Waterborne Preservatives
AWPA M4	(1996) Standard for the Care of Preservative-Treated Wood Products

SOUTHERN PINE INSPECTION BUREAU (SPIB)

SPIB	(1994; Supplement 8 thru 11) Standard Grading Rules for Southern Pine Lumber

AMERICAN LUMBER STANDARDS COMMITTEE (ALSC)

ALSC	American Lumber Standards Committee

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Data

Hardware

SD-13 Certificates

Grading and Marking; G

Notarized Manufacturer's Certificates attesting that lumber and material meet the specified requirements for species, grade, finish and treatment per referenced standards. Certificate of Inspection for grade marked material by an ALSC recognized inspection agency prior to shipment.

1.4 DELIVERY AND STORAGE

Materials shall be delivered to the site in undamaged condition, stored 12 inches above the ground to provide ventilation, piled to shed water and to prevent warp. Suitable covering may be required to protect the materials from the weather.

PART 2 PRODUCTS

2.1 LUMBER

2.1.1 Grading and Marking

2.1.1.1 Lumber Products

Fabricate lumber and timber before preservative treatment. Solid sawn and finger-jointed lumber shall bear an authorized gradestamp or grademark recognized by SPIB recognized certification stamp, mark, or hammerbrand. Markings shall identify both the strength, grade and the manufacturer.

2.1.2 Sizes

Lumber and material sizes shall conform to requirements of the rules or standards under which produced. Unless otherwise specified, lumber shall be surfaced on four sides. Unless otherwise specified, sizes indicated are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which the product is produced.

2.1.3 Treatment

2.1.3.1 Decking Lumber

All decking lumber shall be pressure treated in accordance with AWPA C1, AWPA C2 and AWPA C18 with waterborne preservatives listed in AWPA P5 to a net retention level by assay of 0.6 lb. of chromated copper arsenate Type C per cubic foot of wood as determined by chemical assay according to AWPA A2.

2.1.3.2 Lumber and Timbers

All lumber and timbers, not described in section above, shall be pressure treated in accordance with AWPA C1, AWPA C2 and AWPA C18 with waterborne preservatives listed in AWPA P5 to a net retention level by assay of 2.5 lb. of chromated copper arsenate Type C per cubic foot of wood as determined by chemical assay according to AWPA A2.

2.1.3.3 Field Treatment

Exposed areas of treated wood that are cut or drilled after treatment shall receive a field treatment in accordance with AWPA M4, Section 1.5 FIELD TREATMENT.

2.1.4 Moisture Content

At the time lumber and other materials are delivered and when installed in the work their moisture content shall be as follows:

a. Before Lumber Treatment: 4 inches or less, nominal thickness, 19 percent maximum. 5 inches or more, nominal thickness, 23 percent maximum in a 3 inch perimeter of the timber cross-section.

2.1.5 Wood

All timber materials shall be Southern Yellow Pine, Grade Number 1 minimum per the SPIB rules.

2.1.6 Inspection For Preservative Treatment

The Contractor shall notify the Contracting Officer not less than 2 weeks prior to the start of preservative treatment, stating the place where treatment will be done. Arrangements for access and facilities in this regard shall be made by the Contractor. In lieu of the inspection specified above, the Contracting Officer may elect to accept manufacturer's certificates stating that marine lumber and timbers conforms to the requirements of AWPA C1, AWPA C2 and AWPA A2.

2.2 HARDWARE

All of the hardware listed below shall be hot dipped galvanized in accordance with ASTM A 153. The coating shall be Class A, 2.0 ounces of zinc per square foot of hardware surface. Individual hardware shall conform to the following:

2.2.1 Bolts and Nuts

Bolts and nuts shall conform to ASTM A 307 for Grade A steel and shall have hexagonal heads.

2.2.2 Dock and Standard Cut Washers

Dock and standard cut washers shall be fabricated from a commercial grade steel and conform to ASTM F 844 with the exception that galvanizing shall be as specified above.

2.2.3 Spikes and Nails

Spikes and nails shall be the common wire type and shall meet AISI 1010 or AISI 1020 for steel.

2.2.4 Spike Grids

Spike grids shall conform to ASTM A 47, Grade 32510 for malleable iron castings.

PART 3 EXECUTION

3.1 WALKWAY DECK AND FRAMING

3.1.1 General

After driving piles as outlined in Section 02457 ROUND TIMBER PILES, all walkway deck framing materials shall be accurately assembled, set, regularly spaced, and coursed; and they shall be true to line, even, square, plum, tight and level.

3.1.2 Fastening

In the installation of bolts, all boltholes shall be a minimum diameter to assure a tight and driving fit. Holes shall be of a diameter such that bolts are inserted by light tapping. All counterbored holes (if required) for the installation of washers shall not be more than 1.0 inch in depth. All bolts shall have a 1/4 inch length of thread outside the face of all nuts after tightening, cutting and trimming of bolt ends is completed. The geogrids shall be placed between structural members where shown on the plans and fastened in accordance with the manufacturer's instructions.

3.1.3 Deck Placement

The decking shall be placed as shown on the Contract Drawings. To prevent splitting of the ends of the lumber, pilot holes at the end of the decking shall be drilled prior to nailing to the stringers. The Contractor shall place the wood grain rings of the decking down on the stringers.

3.1.4 Field Treatment

Field treat cuts, bevels, notches, and abrasion made in the field in treated timbers in accordance with AWPA M4. Trim cuts and abrasions before field treatment. Paint depressions or openings around bolt holes, joints, or gaps including recesses formed by counterboring with preservative treatment used for timber.

3.2 ROADWAY GUARD RAIL

3.2.1 Posts

Excavate holes for posts to the diameter and at the locations shown without disturbing the underlying materials. Place posts plumb in hole and tamp

backfill for consolidation. Recheck vertical and top alignment of posts and make necessary corrections as approved by the Contracting Officer.

3.2.2 Guard Rails

After placement of the posts, guard rails shall be accurately assembled and set; and then shall be trued to line, even, square, tight and level. Butt rails at posts only.

3.2.3 Fastening

In the installation of bolts, all boltholes shall be a minimum diameter to assure a tight and driving fit. Holes shall be of a diameter such that bolts are inserted by light tapping. All bolts shall have a 1/4 inch length of thread outside the face of all nuts after tightening, cutting and trimming of bolt ends is completed. Heads of carriage bolts shall be positioned along the rail.

3.3 MEASUREMENT AND PAYMENT

3.3.1 General

Measurement and payment shall be in accordance with Section 01270, MEASUREMENT AND PAYMENT.

-- End of Section --

APPENDIX A

GEOTECHNICAL DESIGN ANALYSIS
&
SOIL BORINGS

STA.
OFFSET:
TOP ELEV: -1.1

Ocean City Water Resources
Isle of Wight Bay, MD

N 268403.0
E 1854538.0
COMPLETED: April 7, 1998

DH-1
1 of 1

DEPTH (ft)	(c)	(d)	DEPTH (ft)	(a)	(b)
2.0	Very moist, gray, poorly graded med. to fine SAND w/ silt (SP-SM) w/ organic matter (roots)			2-5-6	
3.2	Very moist, gray, silty clayey fine SAND (SC)				
4.5	Very moist, gray, poorly graded med. to fine SAND w/ silt (SP-SM)			2-12-10	
7.0	Wet, gray brown, silty fine SAND (SM)		5	4-2-5	
9.5	Very moist, gray, lean CLAY w/ med. to fine sand & tr. of mica (CL)			3-4-4	
10.4	Very moist, gray, lean CLAY w/ fine sand & tr. of mica (CL)		10	5-7-10	
17.0	Very moist, gray, poorly graded med. to fine SAND w/ silt (SP-SM)			5-8-12	
18.3	Very moist, gray, silty clayey SAND (SC)		15	4-4-5	
22.0	Very moist, gray, poorly graded med. to fine SAND w/ silt (SP-SM)			5-7-9	
24.5	Wet, dark gray, fat CLAY w/ tr. of med. to fine sand (CH)		20	5-4-6	
27.0	Very moist, gray, fine sandy fat to lean CLAY (CH)			4-5-9	
29.5	Moist, dk.gray, lean CLAY w/ tr. of medium to fine sand (CL)		25	2-5-4	
31.5	Moist, dk.gray, lean CLAY w/ tr. of fine sand (CL)			1-2-2	47.1
			30	2-2-4	
			35		

Note:

A sounding of the Isle of Wight Bay was collected using a weighted measuring tape prior to sampling.
Sounding at drill site DH-1 was measured at 2.33' @ 1433 hrs.
Top elevation reference: MLLW

DH-1
GROUNDWATER DATA
▽ WHILE DRILLING:
▽ ON COMPLETION:
▼ Hr. READING:

Fill | Auger | SPT | RB | Cored

GEO-2 ISLEWIGH.GPJ 6/9/98 10:58

STA.
OFFSET:
TOP ELEV: -1.3

Ocean City Water Resources
Isle of Wight Bay, MD

N 268338.0
E 1855017.0
COMPLETED: April 7, 1998

DH-2
1 of 1

DEPTH (ft)	(c)
0.5	Wet, gray, silty med. to fine SAND (SM)
2.0	Wet, dk., gray brown, lean CLAY w/ tr. of sand (CL)
	Moist, lt. gray & pale brown, fine sandy lean CLAY (CL)
4.5	
	Very moist, pale brown to gray & pale brown, silty fine SAND w/ tr. of mica (SM)
9.5	
	Wet, gray, silty fine SAND w/ tr. of mica (SM)
12.0	
	Very moist, dk. gray, silty clayey med. to fine SAND (SC)
14.5	
	Very moist, dk. gray, clayey med. to fine SAND (SC)
17.0	
	Wet, green gray, poorly graded med. to fine SAND w/ silt (SP-SM)
19.5	
20.7	Wet, green gray, poorly graded fine SAND w/ silt (SP-SM)
22.0	Wet, very dk. gray brown, SILT w/ fine sand (ML) w/ one black coarse gravel, some clay
	Moist, dk. gray brown, fine sandy SILT (ML)
26.2	
26.5	Moist, gray, fat to lean CLAY w/ fine sand (CH)

Note:

A sounding of the Isle of Wight Bay was collected using a weighted measuring tape prior to sampling.
Sounding at drill site DH-2 was measured at 2.6' @ 1305 hrs.
Top elevation reference: MLLW

DEPTH (ft)	(d) (a)	(b)
	WH-1-1	
	1-3-5	
5	3-5-6	
	2-2-7	
10	7-5-9	
	3-3-5	
15	2-1-3	
	4-8-10	
20	4-2-6	
	5-7-12	
25	7-5-7	
30		
35		

DH-2
GROUNDWATER DATA
▽ WHILE DRILLING:
▼ ON COMPLETION:
▼ Hr. READING:

Fill Auger SPT RB Cored

GEO-2 ISLEWIGH.GPJ 6/9/98 10:58

STA.
OFFSET:
TOP ELEV: -1.4

Ocean City Water Resources
Isle of Wight Bay, MD

N 268338.0
E 1855467.0
COMPLETED: April 7, 1998

DH-3
1 of 1

DEPTH (ft)	(c)	(d) DEPTH (ft)	(a)	(b)
0.2	Wet, gray & brown, silty med. to fine SAND (SM)		WH-1-2	32.8
2.0	Moist, lt. yellow brown, lean CLAY w/ fine sand (CL)			
	Very moist, yellow brown, med. to fine sandy lean CLAY (CL)		1-1-2	
		5	2-6-7	
7.0				
7.7	Wet, yellow brown, sandy lean CLAY (CL)			
	Moist, brn. yellow, poorly graded med. to fine SAND w/ silt (SP-SM)		11-15-15	
9.5				
10.4	Wet, yellow brown, clayey fine SAND (SC)	10		
	Very moist to moist, brn. yellow to yellow brown, poorly graded med. to fine SAND w/ silt (SP-SM)		6-4-4	
			5-8-11	
		15	4-9-10	
17.0				
	Moist, brown to yellow brown, poorly graded med. to fine SAND w/ silt (SP-SM) w/ one sandy silt lense 20.9' to 21.1'		5-8-15	
		20	5-7-8	
22.0				
	Wet, dk. gray brown, fine sandy SILT (ML) w/ traces of interbedded clay lenses		5-8-11	
24.5				
	Moist, very dk. gray, fine sandy fat CLAY (CH) w/ some interbedded fine sandy silt lenses	25	3-3-10	
27.0				
28.1	Moist, dk. gray brown, fine sandy SILT (ML)			
	Moist, dk. gray, fine sandy fat CLAY (CH)		3-2-4	
29.5				
	Moist, dk. gray, fat CLAY w/ fine sand (CH) w/ some clayey fine sandy silt lenses	30		
31.5			5-5-6	
	Note:			
	A sounding of the Isle of Wight Bay was collected using a weighted measuring tape prior to sampling.	35		
	Sounding at drill site DH-3 was measured at 3.4' @ 0751 hrs.			
	Top elevation reference: MLLW			

DH-3
GROUNDWATER DATA
▽ WHILE DRILLING:
▼ ON COMPLETION:
▼ Hr. READING:

Fill | Auger | SPT | RB | Cored

GEO-2 ISLEWIGH.GPJ 6/9/98 10:59

STA.
OFFSET:
TOP ELEV: -1.6

Ocean City Water Resources
Isle of Wight Bay, MD

N 268338.0
E 1855916.0
COMPLETED: April 7, 1998

DH-4
1 of 1

DEPTH (ft)	(c)	(d) DEPTH (ft)	(a)	(b)
0.4	Wet, very dk. gray, silty med. to fine SAND (SM)		WH-2-5	
2.0	Moist, brown & yellow brown med. to fine sandy fat CLAY (CH)			
	Very moist, lt. yellow brown & yellow brown silty med. to fine SAND (SM)		1-5-8	
4.5		5		
	Moist to very moist, yellow brown. fine sandy SILT w/ tr. of mica (ML)		2-3-4	
			2-3-7	
9.5		10		
	Wet, yellow brown, fine sandy silty CLAY w/ tr. of mica (CL)		2-5-5	
12.0				
	Very moist, brown & yellow brown, silty med. to fine SAND contains clay lenses (SM)		5-8-8	
14.5		15		
	Very moist, pale brown,, poorly graded SAND w/ silt (SP-SM) w/ a tr. of fine sandy silt lenses		3-7-11	
17.0				
	Very moist, lt. yellow brown, poorly graded med. to fine SAND (SP)		4-8-10	
19.5				
20.6	Wet, yellow brown, poorly graded med. to fine SAND w/ silt (SP-SM) w/ a tr. of coarse sand	20	2-5-6	
22.0	Moist, gray & yellow brown, sandy silty CLAY (CL)			
	Wet, dk. gray silty clayey fine SAND (SC)		3-4-7	
24.5		25		
	Wet, gray fine sandy SILT (ML)		4-4-5	
26.5				
		30		
		35		

Note:

A sounding of the Isle of Wight Bay was collected using a weighted measuring tape prior to sampling.
Sounding at drill site DH-4 was measured at 2.9' @ 1153 hrs.
Top elevation reference: MLLW

DH-4
GROUNDWATER DATA
▽ WHILE DRILLING:
▽ ON COMPLETION:
▼ Hr. READING:

Fill | Auger | SPT | RB | Cored

GEO-2 ISLEWIGH.GPJ 6/9/98 10:59

STA.
OFFSET:
TOP ELEV: -1.6

Ocean City Water Resources
Isle of Wight Bay, MD

N 268338.0
E 1856336.0
COMPLETED: April 7, 1998

DH-5
1 of 1

DEPTH (ft)	(c)	(d)
2.9	Wet, gray to lt. brown, silty med. to fine SAND (SM)	
4.5	Moist, lt. gray & yellow brown, silty med. to fine SAND (SM)	
7.0	Very moist, lt. gray, gray & yellow brown, silty med. to fine SAND (SM)	
12.0	Moist, dk. gray & brown to brown, fine sandy SILT w/ tr. of mica (ML)	
14.5	Moist, gray & gray brown, silty fine SAND (SM)	
15.2	Very moist, gray brown, poorly graded SAND w/ silt (SP-SM) w/ some coarse sand 15.0' - 15.2'	
17.0	Moist, brown, fine sandy silty CLAY (CL)	
19.5	Moist, dk. gray, fine sandy lean CLAY (CL)	
20.3	Moist, dk. gray, lean CLAY w/ sand & tr. of mica (CL)	
22.0	Wet, yellow brown, silty clayey SAND (SC)	
25.4	Moist, yellow brown to brown, fine sandy SILT (ML)	
25.8	Moist, weak red, gray & brown, fine sandy fat CLAY (CH)	
27.0	Moist, gray, med. to fine sandy SILT w/ lenses of clay (ML)	
31.5	Moist, dk. gray, fat CLAY w/ fine sand ((CH)	

Note:

A sounding of the Isle of Wight Bay was collected using a weighted measuring tape prior to sampling.
Sounding at drill site DH-5 was measured at 2.9' @ 1615 hrs.
Top elevation reference: MLLW

DEPTH (ft)	(a)	(b)
	1-2-3	
	5-10-12	
5	3-6-5	
	5-6-15	
10	7-13-13	
	7-7-11	
15	7-11-13	
	3-3-6	
20	6-8-11	29.6
	7-13-28	
25	4-8-12	
	4-6-5	
30	4-3-4	
35		

DH-5
GROUNDWATER DATA
▽ WHILE DRILLING:
▽ ON COMPLETION:
▼ Hr. READING:

Fill Auger SPT RB Cored

GEO-2 ISLEWIGH.GPJ 6/9/98 10:59

STA.
OFFSET:
TOP ELEV: -1.6

Ocean City Water Resources
Isle of Wight Bay, MD

N 268501.0
E 1856458.0
COMPLETED: April 8, 1998

DH-6
1 of 1

DEPTH (ft)	(c)	(d) DEPTH (ft)	(a)	(b)
2.0	Wet, dk. gray, brown, poorly graded med. to fine SAND w/ silt (SP-SM) w/ pieces of broken sea shells		1-1-2	
4.5	Wet, lt. yellow brown, silty med. to fine SAND (SM)		6-6-8	---
7.0	Wet, lt. yellow brown, poorly graded med. to fine SAND w/ silt (SP-SM) w/ traces of sandy silt lenses	5	7-6-10	81.1 ---
8.4	Very moist, lt. gray & yellow brown, poorly graded med. to fine SAND w/ silt (SP-SM)		6-3-6	
9.5	Moist, gray & gray brown, silty fine SAND (SM)			
12.0	Moist, dk. gray brown, fine sandy SILT (ML)	10	4-6-7	
14.5	Wet, gray, silty CLAY w/ fine sand & tr. of mica (CL-ML)		2-3-3	29.1
15.2	Very moist, gray & brown, silty clayey med. to fine SAND w/ tr. of shell (SC)	15	8-13-12	
17.0	Very moist, gray & yellow brown, silty fine SAND (SM)			
19.5	Very moist to moist, gray, sandy lean to fat CLAY (CL) w/ tr. of silty clay lense		8-8-9	
21.5	Moist, gray sandy lean to fat CLAY (CL)	20	3-5-5	
		25		
		30		
		35		

Note:

A sounding of the Isle of Wight Bay was collected using a weighted measuring tape prior to sampling.
Sounding at drill site DH-6 was measured at 3.4' @ 0734 hrs.
Top elevation reference: MLLW

DH-6
GROUNDWATER DATA
▽ WHILE DRILLING:
▽ ON COMPLETION:
▼ Hr. READING:

Fill | Auger | SPT | RB | Cored

STA.
OFFSET:
TOP ELEV: -1.2

Ocean City Water Resources
Isle of Wight Bay, MD

N 268773.0
E 1856576.0
COMPLETED: April 7, 1998

DH-7
1 of 1

DEPTH (ft)	(c)	(d)	DEPTH (ft)	(a)	(b)
2.0	Wet, black, poorly graded med. to fine SAND w/ silt (SP-SM)			1-1-1	
5.9	Wet, black, fat CLAY w/ fine sand, organic odor (CH) w/ shells			1	
7.0	Wet, black & gray brown, silty fine SAND (SM)		5	WH-WH-WH	
11.3	Wet, gray & yellow brown, poorly graded fine SAND w/ silt (SP-SM)			7-7-10	
12.0	Moist, dk, gray brown, sandy silty CLAY (CL)		10	11-7-4	
17.0	Moist, brown, SILT w/ fine sand (ML)			3-2-5	
19.5	Moist, gray, silty fine SAND (SM)		15	3-2-3	
21.5	Moist, gray, silty med. to fine SAND w/ tr. of mica (SM) interbedded w/ sandy silt lenses			2-7-11	
			20	7-10-11	
			25		
			30		
			35		

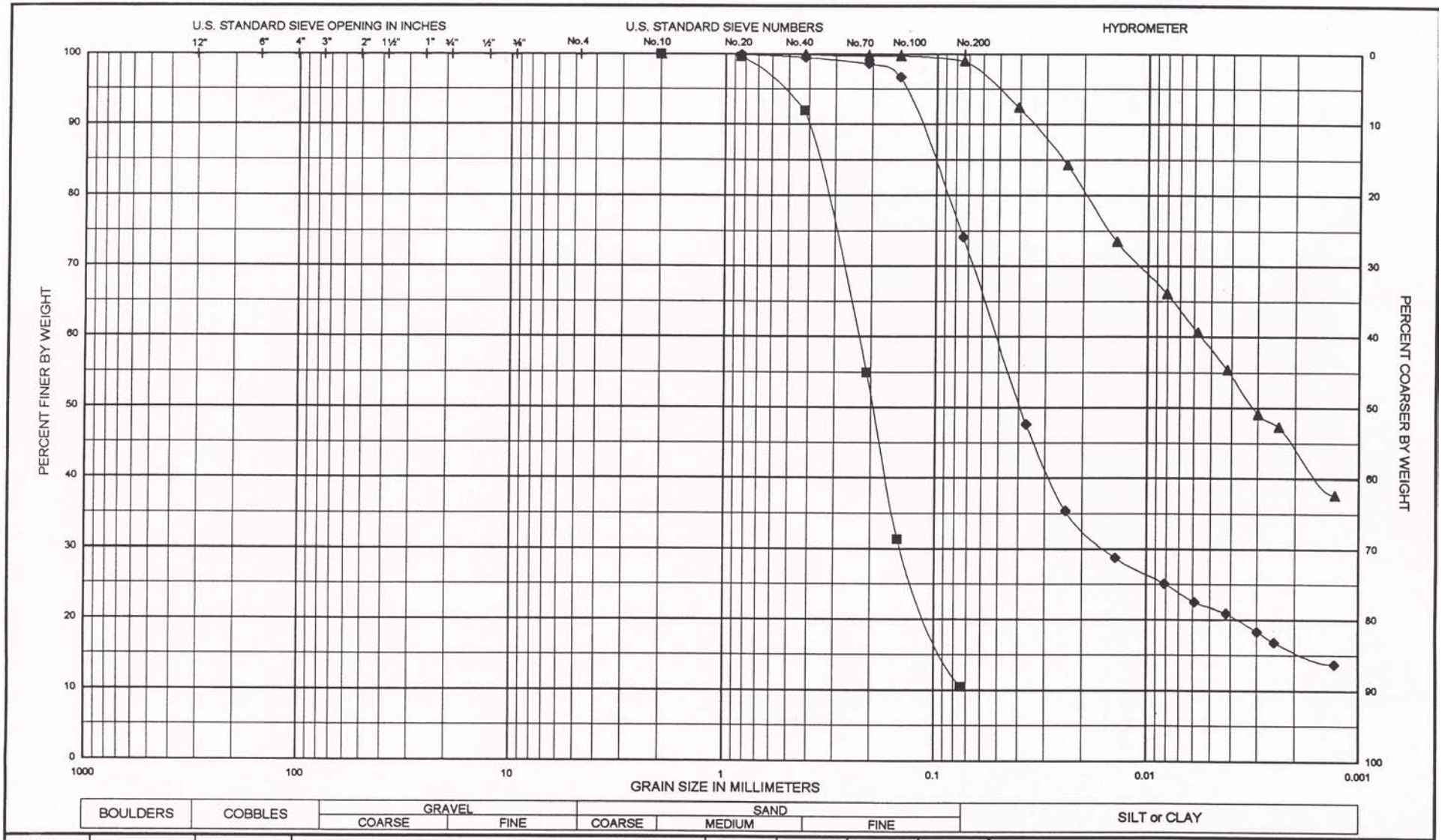
Note:

A sounding of the Isle of Wight Bay was collected using a weighted measuring tape prior to sampling.
Sounding at drill site DH-7 was measured at 2.9' @ 1019 hrs.
Top elevation reference: MLLW

DH-7
GROUNDWATER DATA
▽ WHILE DRILLING:
▽ ON COMPLETION:
▼ Hr. READING:

Fill | Auger | SPT | RB | Cored

GEO-Z ISLEWIGHT.GPJ 6/9/98 10:39



Legend	Sample No.	Depth (ft)	Classification		Nat w%	LL	PL	PI
—■—	Jar-1	0.0-1.5	Poorly graded sand with silt	(SP-SM)	———	———	———	———
—◆—	Jar-5	7.5-9.0	Lean clay with sand (tr. mica)	(CL)	———	———	———	———
—▲—	Jar-15	27.5-29.0	Lean clay (tr. sand)	(CL)	47.1	44	22	22

ENG FORM 2087

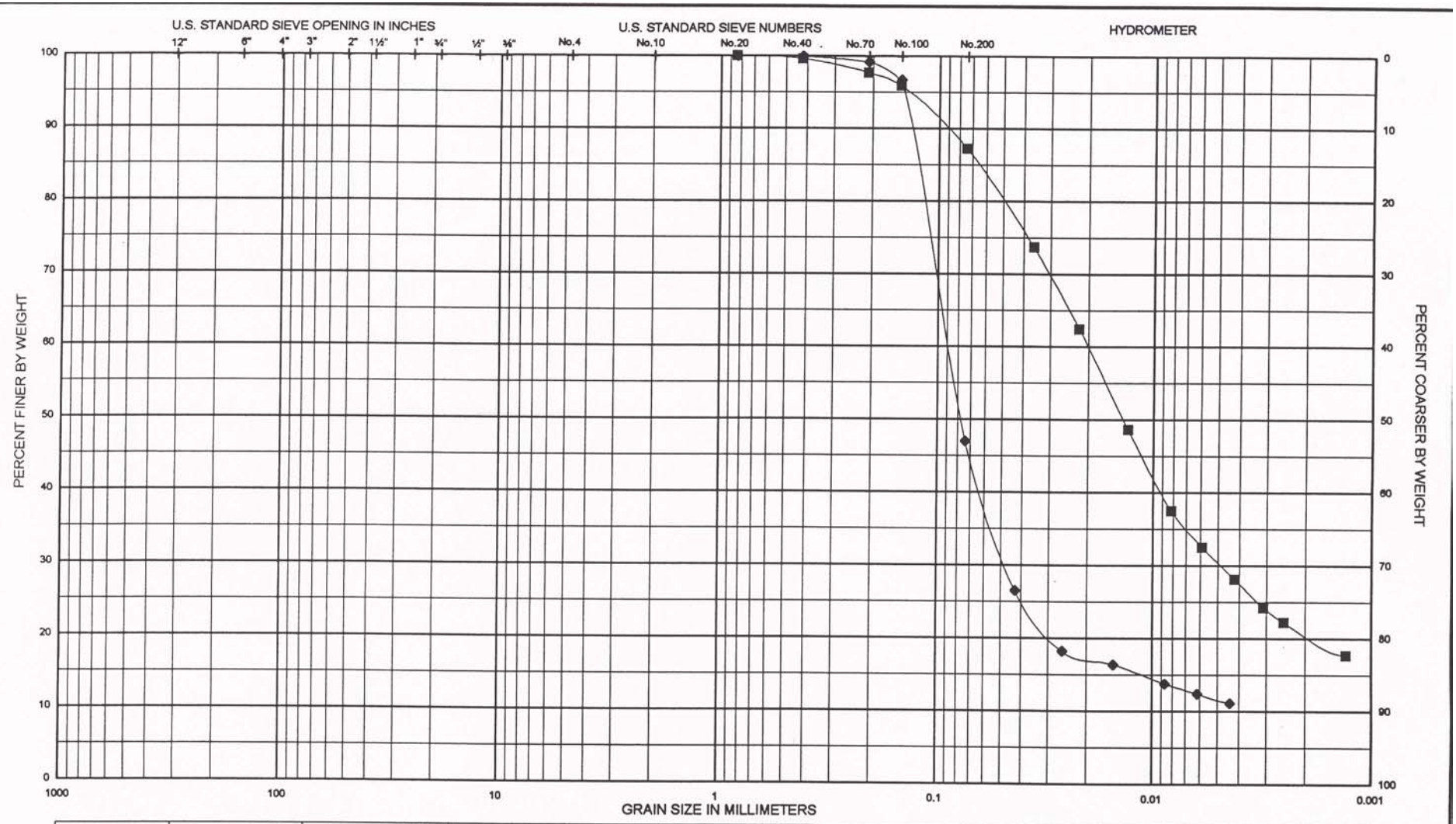
GRADATION CURVES

PROJECT: Ocean City Water Resources
Isle of Wight Bay

AREA: Ocean City, MD

Boring No.: DH-1

DATE: May 1998

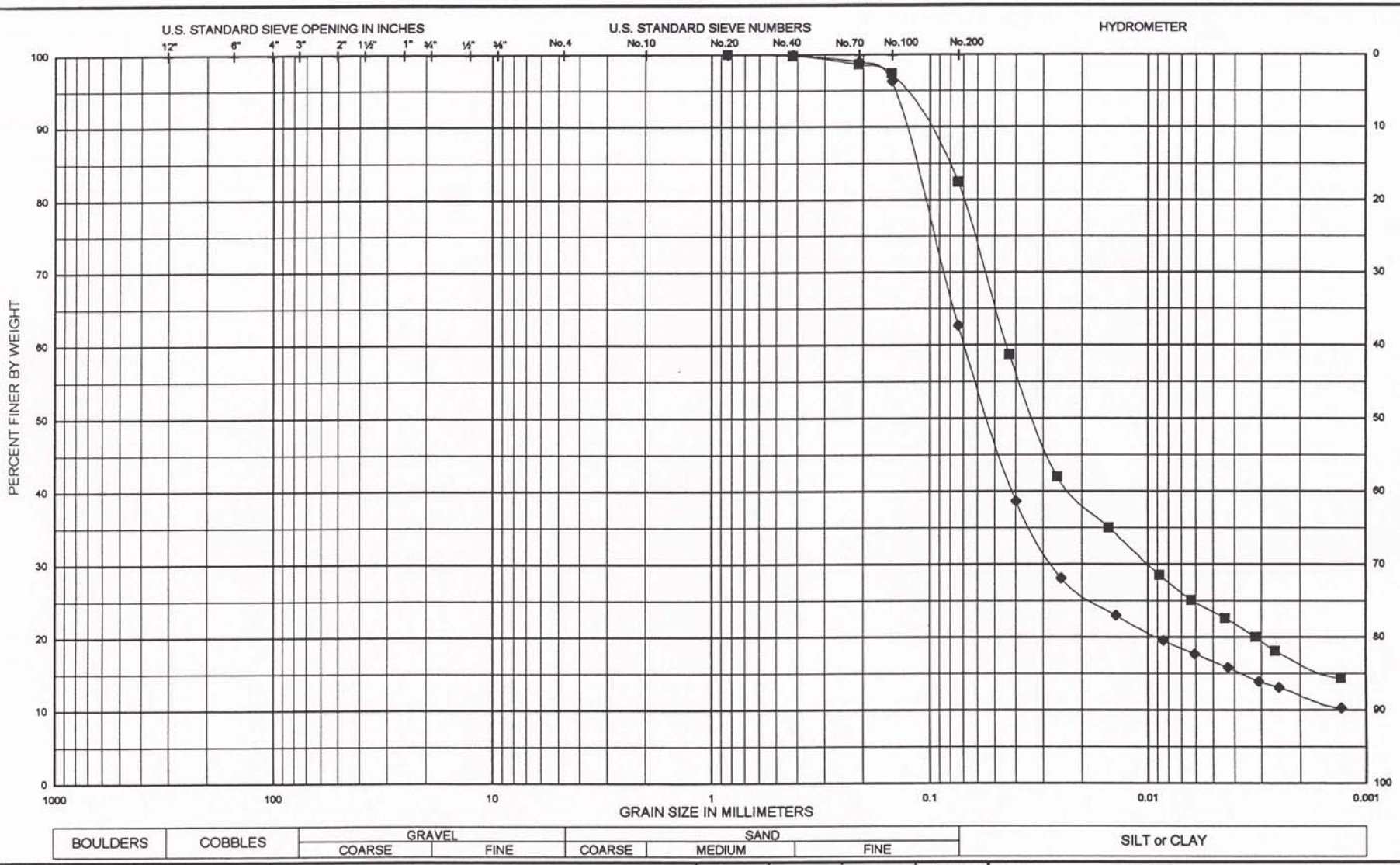


BOULDERS	COBBLES	GRAVEL		SAND			SILT or CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

Legend	Sample No.	Depth (ft)	Classification		Nat w%	LL	PL	PI
—■—	Jar-2	0.5-1.5	Lean clay (tr. sand)	(CL)	——	——	——	——
—◆—	Jar-4	5.0-6.5	Silty sand (tr. mica)	(SM)	——	——	——	——

ENG FORM 2087 **GRADATION CURVES**

PROJECT: Ocean City Water Resources
Isle of Wight Bay
AREA: Ocean City, MD
Boring No.: DH-2
DATE: May 1998



Legend	Sample No.	Depth (ft)	Classification		Nat w%	LL	PL	PI
—■—	Jar-2	0.2-1.5	Lean clay with sand	(CL)	32.8	38	24	14
—◆—	Jar-4	5.0-6.5	Sandy lean clay	(CL)	———	———	———	———

ENG FORM 2087

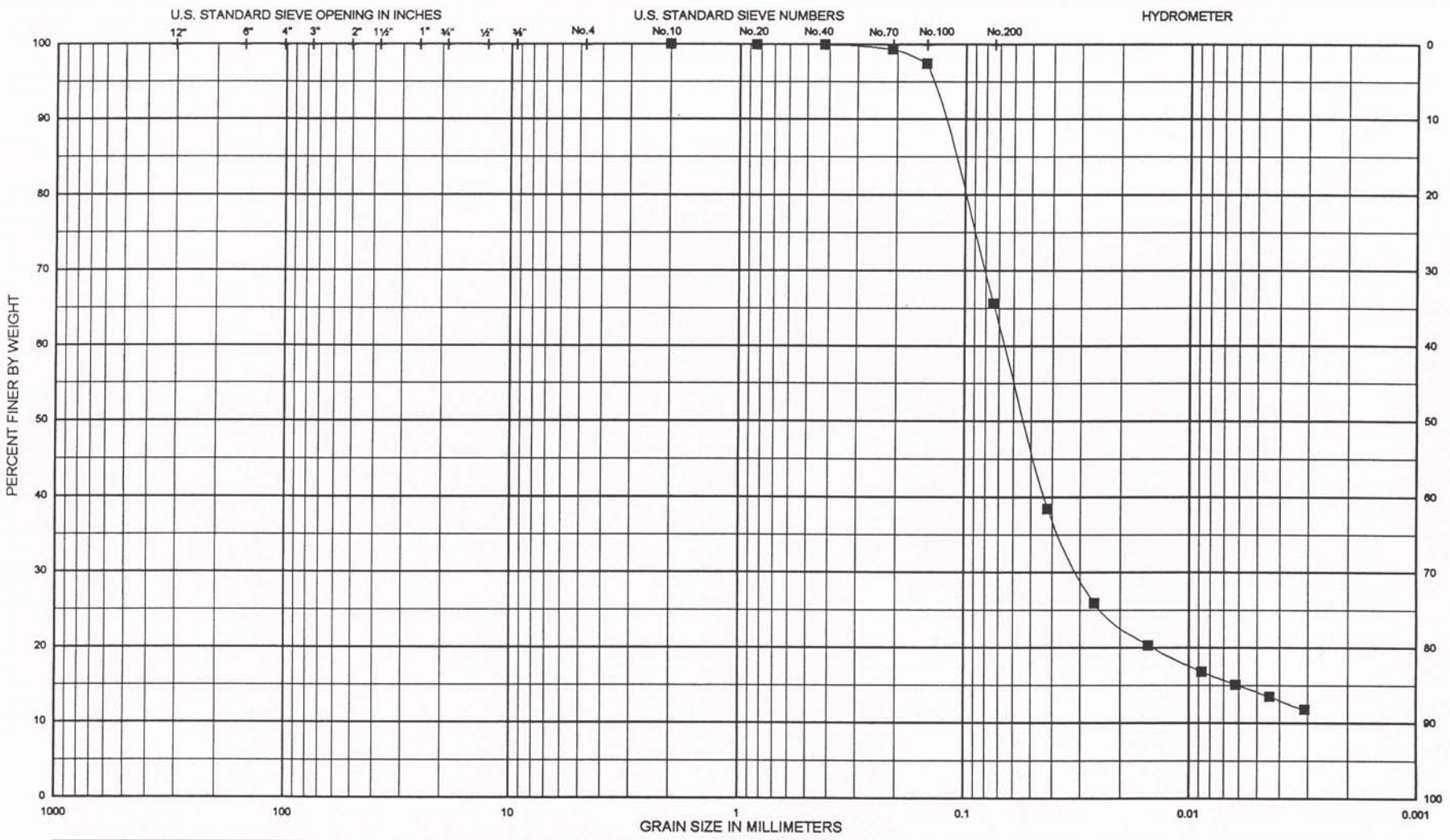
GRADATION CURVES

PROJECT: Ocean City Water Resources
Isle of Wight Bay

AREA: Ocean City, MD

Boring No.: DH-3

DATE: May 1998



Legend	Sample No.	Depth (ft)	Classification	Nat w%	LL	PL	PI
—■—	Jar-4	5.0-6.5	Sandy silt (tr. mica) (ML)	———	———	———	———

ENG FORM 2087

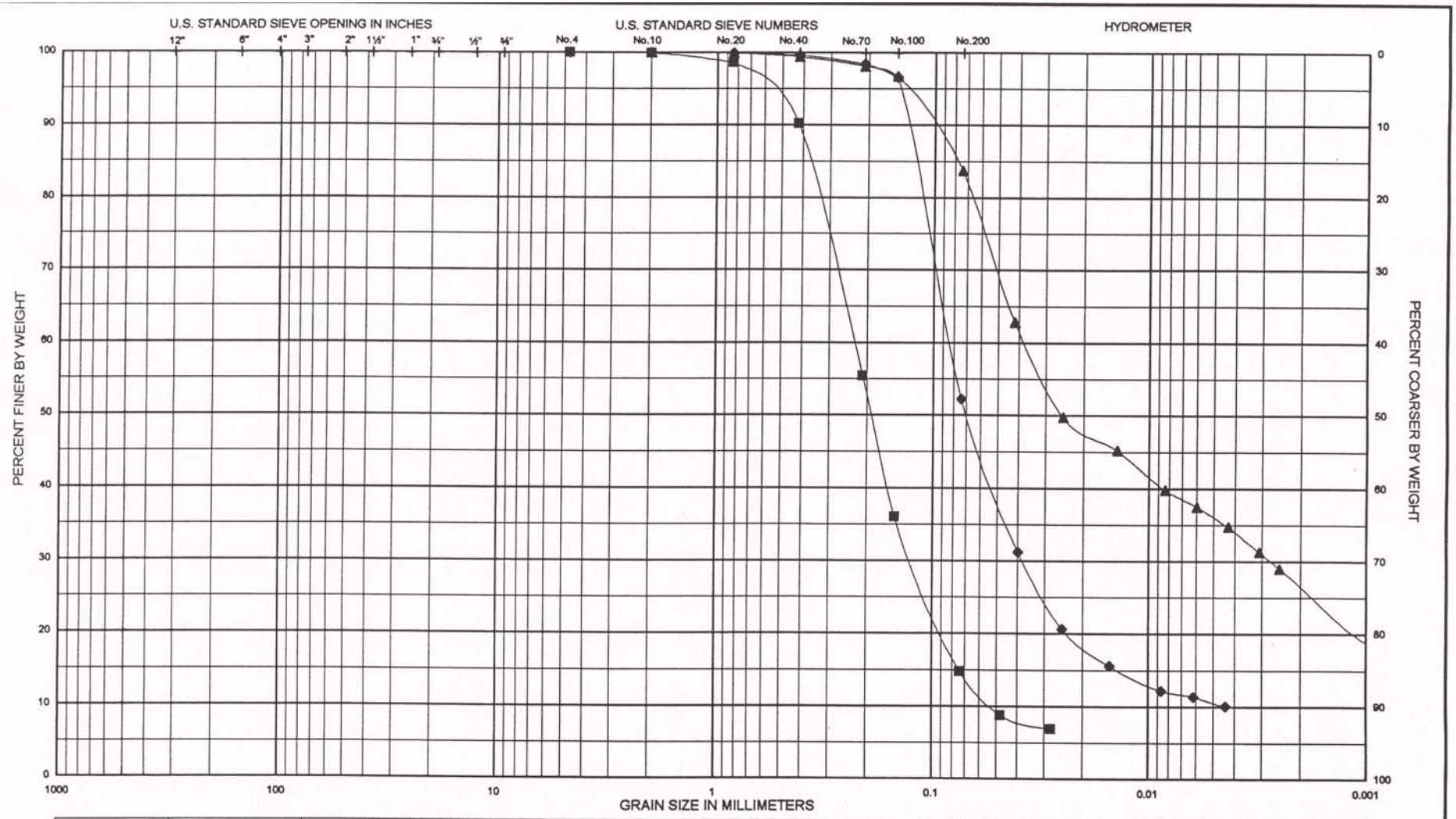
GRADATION CURVES

PROJECT: Ocean City Water Resources
Isle of Wight Bay

AREA: Ocean City, MD

Boring No.: DH-4

DATE: May 1998



Legend	Sample No.	Depth (ft)	Classification		Nat w%	LL	PL	PI
—■—	Jar-1	0.0-1.5	Silty sand	(SM)	———	———	———	———
—◆—	Jar-5+6	7.5-11.5	Sandy silt (tr. mica)	(ML)	———	———	———	———
—▲—	Jar-11	20.0-20.3	Lean clay with sand (tr. mica)	(CL)	29.6	30	17	13

ENG FORM 2087

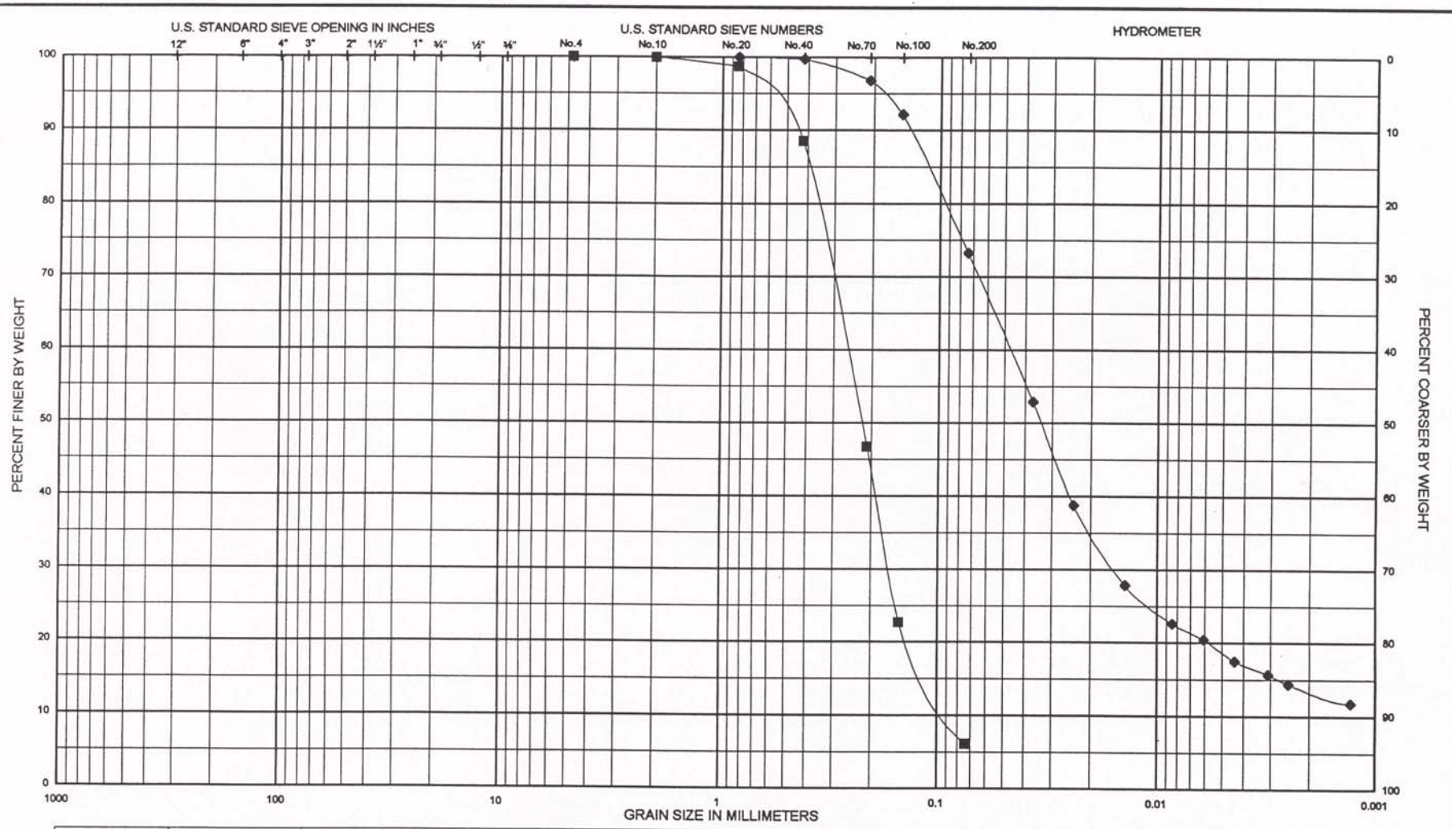
GRADATION CURVES

PROJECT: Ocean City Water Resources
Isle of Wight Bay

AREA: Ocean City, MD

Boring No.: DH-5

DATE: May 1998



Legend	Sample No.	Depth (ft)	Classification		Nat w%	LL	PL	PI
—■—	Jar-1	0.0-1.5	Poorly graded sand with silt	(SP-SM)	———	———	———	———
—◆—	Jar-7	12.5-14.0	Silty clay with sand (tr. mica)	(CL-ML)	29.1	22	18	4

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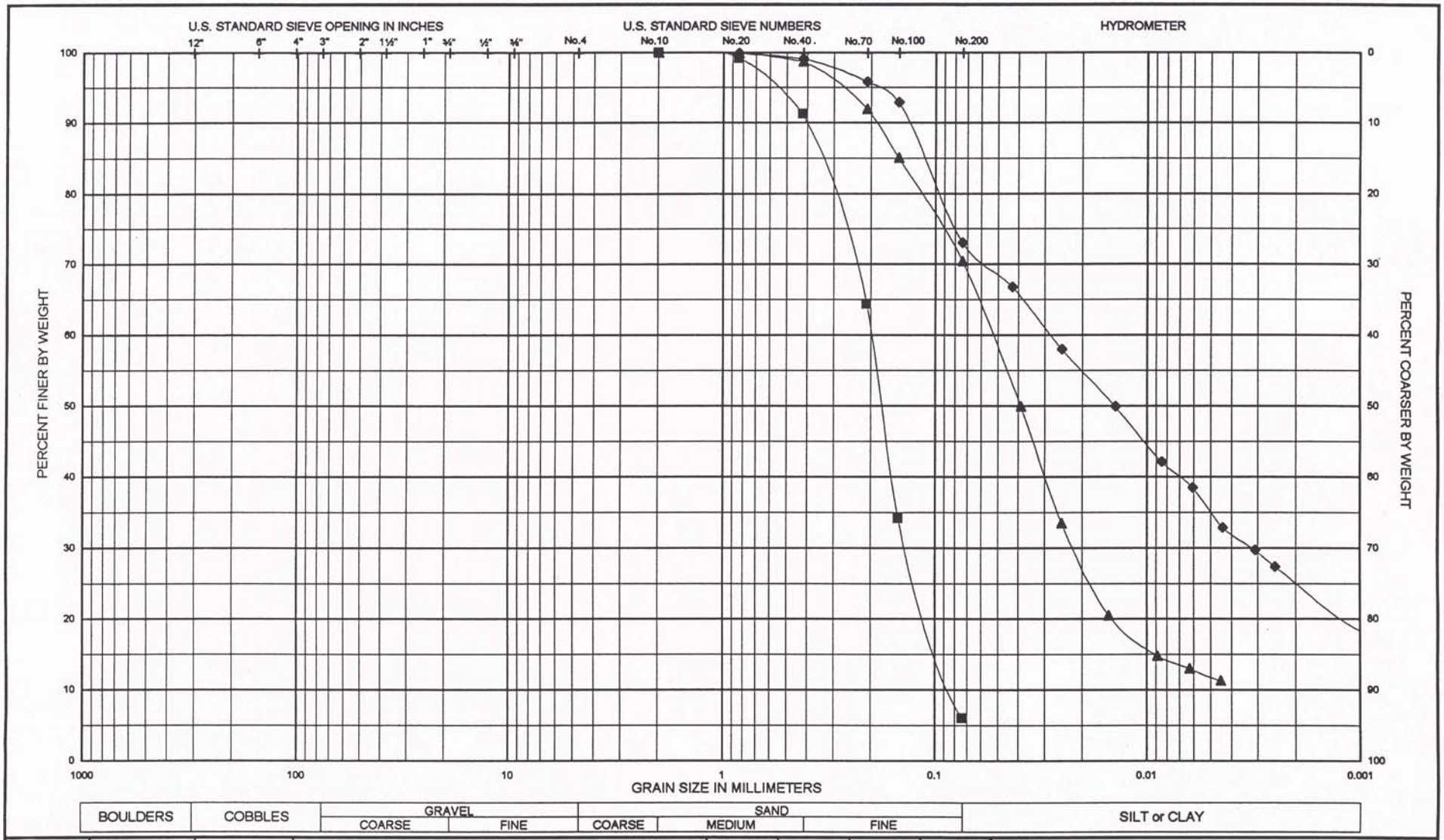
GRADATION CURVES

PROJECT: Ocean City Water Resources
Isle of Wight Bay

AREA: Ocean City, MD

Boring No.: DH-6

DATE: May 1998



Legend	Sample No.	Depth (ft)	Classification		Nat w%	LL	PL	PI
—■—	Jar-1	0.0-1.5	Poorly graded sand with silt	(SP-SM)	———	———	———	———
—◆—	Jar-2+3	2.5-5.9	Fat clay with sand	(CH)	81.1	56	23	33
—▲—	Jar-8+9	12.5-16.5	Silt with sand	(ML)	———	———	———	———

PROJECT: Ocean City Water Resources
Isle of Wight Bay
AREA: Ocean City, MD
Boring No.: DH-7
DATE: May 1998

ENG FORM 2087

GRADATION CURVES